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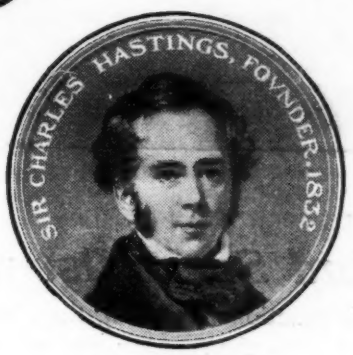

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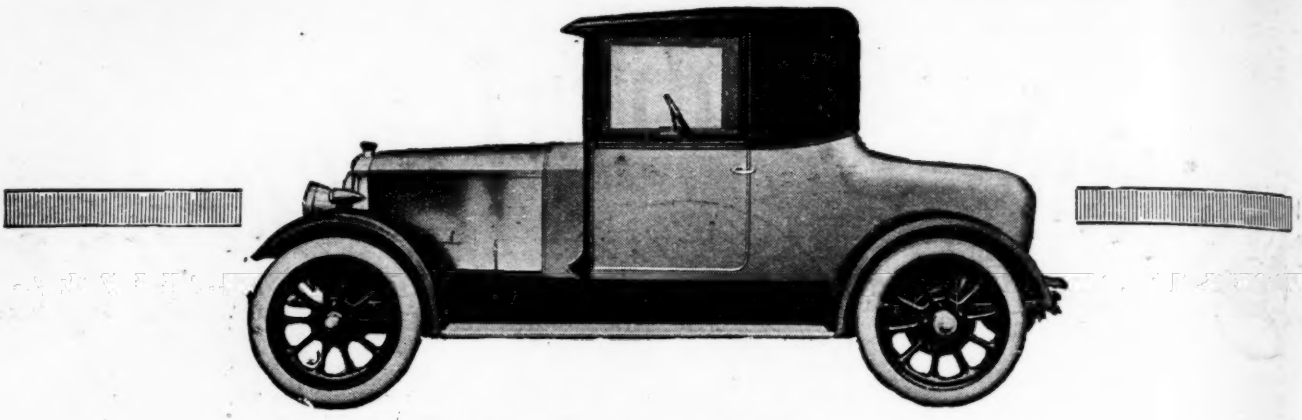

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ON

JOHN HUNTER (1728–1793): HIS AFFAIRS, HABITS, AND OPINIONS.

DELIVERED AT THE ROYAL COLLEGE OF SURGEONS, FEBRUARY 14TH, 1923,

BY

SIR JOHN BLAND-SUTTON, F.R.C.S.,
CONSULTING SURGEON, MIDDLESEX HOSPITAL.

MY knowledge of John Hunter began in a curious way. In my ninth year I was taken to his famous house at Earl's Court and shown the den in the garden where he kept wild beasts in order to study them. Being fond of animals, this made a deep impression on my mind. In the simple religious exercises of my childhood, the story of Adam and Eve, the first keepers of a zoological garden, and the famous exploits of Noah, collector and preserver of wild animals, had great charm for me. Some years later the visit came vividly to my mind on finding a dilapidated copy of Ottley's *Life of Hunter*, which I read eagerly. Ever since I have been deeply interested in all that relates to this extraordinary man, and the preparation of this Oration has been to me a delightful and engrossing occupation.

LONG CALDERWOOD (1728–1748).

John Hunter was born at the farmhouse Long Calderwood, near Glasgow. The house bears a tablet to the effect that he was born February 13th, 1728. In his lifetime the birthday was kept on February 14th, and this College drinks to his memory in "Solemn Silence" on the 14th. Like myself he was probably born so late at night that in the hurry-scurry the midwife failed to notice whether he appeared just before or shortly after the clock struck twelve.

FIG. 1.—The nerves on the nasal septum. (Hunterian.)

John, or Jockie, as he was called at home, the youngest of a family of ten, petted by his mother (his father died in 1741, aged 78), disliked school and hated books. He preferred to lead an out-of-doors life, looking after nests, insects, and animals, whilst his brothers got the same education as country gentlemen.

At the age of 17 he spent some months with a brother-in-law, a timber merchant and carpenter in Glasgow, and we can well believe he tried his hand with tools; his mother noticed that the "lad showed neatness of hands and quickness of perception in anything that regarded mechanism." What inquisitive boy has not meddled with awls and gimlets, mallets and chisels, hammers and nails, saws and planes?

Sharp boys can learn much that is useful in workshops, and a training in joinery teaches neatness and precision. Looking back it is instructive to consider how the farm life fitted John Hunter for his subsequent career. The practical surgeon is a craftsman: Greek and Latin are useful to him for polish, but think of the natural knowledge a smart boy can collect on a farm about sowing, sprouting, and the ripening of crops; the breeding of animals, gelding of colts, spaying of pigs, caponizing of cocks, fattening and slaughtering of animals for food; farriery—shoeing and doctoring of horses; the wild life in ponds and ditches, fields and hedgerows, trees and heather. In the village he can watch the wheelwright, smith, tinker, glazier, cobbler, and cooper, all experts with simple tools.

Practical knowledge of this kind was useful in that state of life unto which William Hunter called his youngest brother.

HUMAN ANATOMY (1748–1760).

At the age of 20 John Hunter came to London with the object of assisting his brother William, who had a school of anatomy at the back of his house in Covent Garden. John showed unusual skill in dissecting, worked hard, liked the companionship of men of his own age, and was fond of the theatre. There can be no doubt that he was an example of the medical student skilfully described by Dickens in *Pickwick Papers* (1836) and Albert Smith in *Punch* (1841).

Human anatomy appealed to this uncouth Scot, and William Hunter, a cultured man, moulded John's character and "bred him to anatomy" in its widest significance, with astonishing results.

In the summer of 1754 Hunter was busy studying the routes by which the branches of the fifth nerve leave the skull—a fascinating exercise. He unravelled the branches of the olfactory nerve, traced the course of the naso-palatine nerve, and the rambling nerve known as the nasal branch of the ophthalmic division of the fifth. A specimen (Fig. 1) he dissected to show these nerves exists in the museum, in excellent condition.

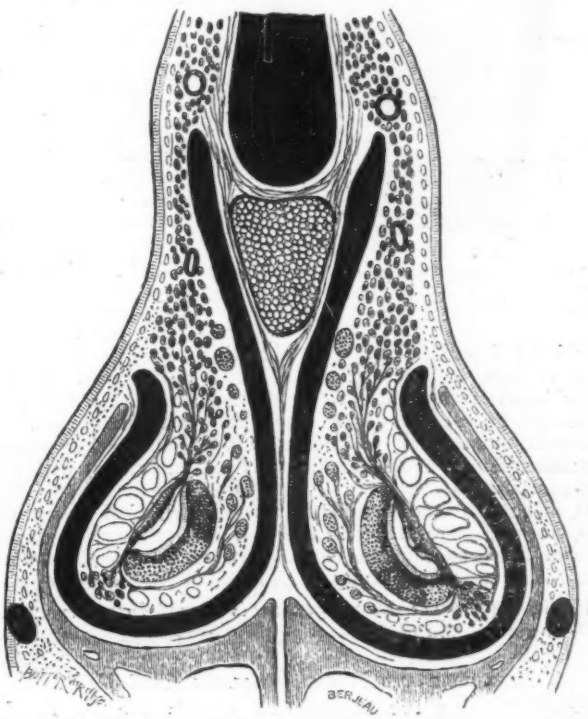

FIG. 2.—Section of a rabbit's nose exposing Jacobson's organ. (Klein.)

Hunter's attention was arrested by the uniformity in the course and distribution of nerves. Even now, few grasp the problem presented by the branches of the olfactory nerve which run down the anterior border of the nasal septum. In 1811 Jacobson, a surgeon in the Danish army, discovered a curious organ lodged in a scroll of cartilage situated on the anterior part of the base of the nasal septum (Fig. 2).

Jacobson's organ—a vestige in man, apes, and whales—is well developed in many mammals. Little is known of its function, but the specialized cells lining its cavity receive the olfactory twigs detected by Hunter. Jacobson's organ is well developed in mammals with long snouts, especially insectivora that find food at dusk; rodents whose young are born blind and live in deep burrows; and kangaroos, whose young must find their way into, and pass many weeks snugly ensconced in, the mother's warm pouch.

The prime service of olfaction is the quest for food, and is of first-rate importance to mammals born blind—it enables

them to find the teats of the mother. The vomero-nasal is subsidiary to the olfactory organ.

The morphology of the canals and foramina by which the cranial nerves leave the skull has always fascinated me, and many delightful hours of my life have been spent in unravelling the secrets connected with their methods of exit, re-entrance, and final escape from the skull. The study interested Hunter, apart from its morphological aspect. In his day vestiges were merely anatomical curiosities. How much greater the interest for us to unravel these curious courses in the light of man's evolution!

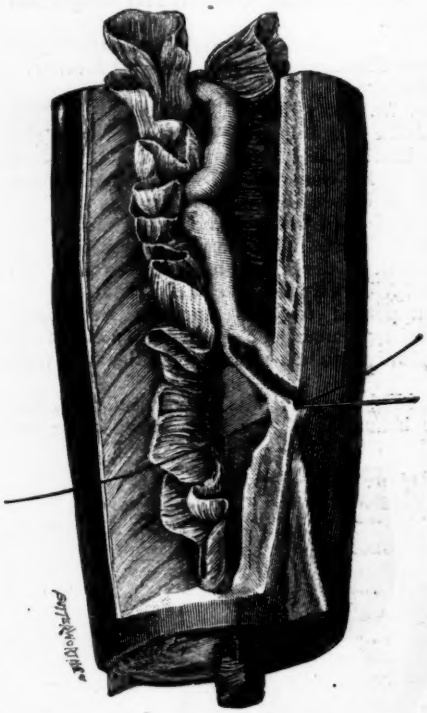

FIG. 3.—Segment of an eel showing the ovary. The bristle marks the end of the rectum and the abdominal pore. (Hunterian.)

For Hunter morphology was a gleam in the intellectual sky. We revel in the sunshine; Morphology has become the Soul of Anatomy.

Many regard the dissection of the human body as a repulsive exercise. Many begin to dissect with disgust, but overcome the distaste and continue the study because it fits them for the medical profession. Some who have found difficulty in retaining or appreciating the facts of anatomy have shone in other professions. On the other hand, men unable to grasp mathematics or the principles of physics have become proficient anatomists. In a few instances men working at a humdrum calling turned to anatomy more or less accidentally and pursued it with zeal and success.

It is easy to understand that the unschooled, apparently idle, Jock Hunter, when introduced to the dissecting-room, became interested in the structure of the human body and found it an absorbing study.

Verily the gunpowder of genius is stored in many minds, but—it needs a match!

BELLEISLE AND MARINE ZOOLOGY (1760–1762).

Hunter during the first period of his life in London (1748–1760) acquired a practical knowledge of human anatomy, but this was mainly a study for the winter months. During the summer he studied surgery, following Cheselden for a season, also Pott, but St. George's Hospital offered better chances, and he joined as surgeon's pupil, and later had the good fortune to serve as house-surgeon for two years—an invaluable experience.

Whilst engaged in the routine of dissecting and teaching he developed a taste for comparative anatomy, which became an absorbing passion, enhanced by a change of locality. In the spring of 1759 he had some lung trouble, which made it necessary for him to seek change of climate. In 1760 a force was sent from England to take Belleisle, near the mouth of the Loire. Hunter applied for an appointment with the expedition and served as staff surgeon. This gave him the chance of obtaining practical knowledge of gunshot wounds.

Belleisle, well named, is a pretty island, now almost treeless. It is a plateau of 33 square miles about 130 feet above sea-level; here and there slopes give access to beautiful tracts of white sand. The coast has many grottoes. The most remarkable is La Grotte de l'Apothicairerie, a sanctuary for sea birds; their nests in rows on ledges of the rocks are supposed to resemble bottles on the shelves of a pharmacy.

I spent a week on this lovely island and realized what a change it proved for a man from London ardently pursuing comparative anatomy, a country new to him in flora and fauna. He took advantage of it by observing, collecting, dissecting, experimenting, preparing and preserving specimens. Hunter had no knowledge of marine zoology until he landed on this island, which afforded him access to barnacles, sea squirts, sea nettles, sea stars, sea anemones, sea cucumbers, sea urchins, huge spider crabs, tunny fish, and conger eels.

While studying and dissecting these animals the idea came into his mind that living things could be arranged in a physiological series, but he was puzzled to ascertain the use of strange organs he met with in marine invertebrata.

Like Cuvier he had to rely on naked-eye dissection, but dissection, however skilful, does not enable anatomists to determine minute structure of soft organs, which is the key to function. These difficulties are shown in Hunter's studies of the reproductive organs of eels. He truly observes, "the production of animals out of themselves excites wonder and curiosity." The precise manner in which it is carried out has required centuries of observation for its demonstration. The eggs of flies, butterflies, fishes, frogs, turtle, crocodiles, snakes, and birds appeal to the simplest mind.

It was difficult to prove that mammals came from eggs, for their small eggs require a microscope to make them visible. This is true of mice and men.

In London he got eels every month of the year from a fishmonger and examined the parts he expected to be the ovary with a magnifier, but without result. In the summer of 1761 there was a vast number of conger eels in the sea around Belleisle; he dissected many and satisfied himself that the ruffle-like organs he regarded as ovaries in the common eel were indeed ovaries (Fig. 3), but he did not solve the mystery of the propagation of eels.

In 1896 Grassi discovered that eels need salt water for the development of their reproductive organs, and the deep

FIG. 4.—Drawing showing the change from a yellow eel with thick lips, small eyes, and compact fin, into the large-eyed silvery eel which migrates to the ocean, where it becomes mature, spawns, and dies. (From models in the Natural History Museum.)

sea is their spawning place. In autumn they migrate to the sea and the dull yellow of their skin changes to silvery glitter; the eyes enlarge, the pectoral fins become black and change in shape, and the ova ripen (Fig 4). Mature eels cease to feed, and after spawning die.

Recently hatched eels, called leptocephali, are as transparent as glass, and the eyes shine through the water like black beads. When about 7 cm. long, leptocephali cease to

fed and change into elvers, which in spring find their way up the rivers in enormous numbers and in fresh water change into eels. These in their turn descend the rivers, seek the depths of the sea, where, decked in glorious sheen, they spawn and die.

Although Hunter did not get on well with his senior colleagues at Belleisle, he was comfortable on his pay, and enjoyed the opportunities for studying natural history, but in 1762 a British expedition to Portugal was the topic of conversation; he was keen to go, and his brother William helped him with the authorities in London to do so.

PORTUGAL AND GEOLOGY (1762–1763).

One of the last episodes of the seven years' war was an attempt on the part of France and Spain to invade Portugal. The French and Spanish forces were collected at Ciudad Rodrigo with the object of advancing on Lisbon.

England decided to support Portugal, and sent an expeditionary force of 7,000 men. The British and Portuguese troops, under the command of Count Schaumburg-Lippe, an able officer trained in the school of Frederick the Great, assembled on the banks of the Tagus near the Spanish border. The outstanding feature of this almost forgotten campaign was the use for the first time of light cavalry, which General John Burgoyne was instrumental in introducing into the British Army. Under Burgoyne the cavalry rendered distinguished service at Valencia d'Alcantara, and in some sharp fighting at Villa Velha. The campaign was concluded by the peace of Paris 1763. Mr. Robert Boyne Home was the surgeon attached to the regiment of light horse.

John Hunter, transferred from Belleisle to Portugal, was in charge of a hospital; he landed at Lisbon in July, 1762, and in November was at Portalegre, near the Spanish frontier, 140 miles from Lisbon. General headquarters was at Estremoz, thirty miles south of Portalegre, on the direct road to Lisbon. Little is known of his doings in Portugal, and it has been supposed he made additional observations on gunshot wounds; for this there was not much opportunity, but with a force of 7,000 men there would be accidents and sickness incidental to a campaign in a foreign country.

FIG. 5.—John Hunter, by Robert Home. The dog is supposed to be the offspring of a half-bred wolf bitch and an English mastiff.

It is certain that in Portugal Hunter made observations of natural history and collected specimens, some of which are preserved in the museum, but the most important gain was an inspiration to study geology. The hill on which Portalegre is built belongs to a remarkable plateau called Alemtejo (spelt Alentejo in 1763). In an extraordinary tract published about fifty years after Hunter's death, under the title *Observations and Reflections on Geology*, he refers to the extensive plateau called Alentejo, which shows evident signs of its surface being covered by the sea, and to the enormous heaps of granite so frequent on the plain. The tract not only contains remarkable observations on geology but some ideas on the distribution of animals in relation to the antiquity of the world inconsistent with the creation as described in Genesis. He abstained from publishing them on the advice of friends.

Recently I visited Portalegre, the Alemtejo, and the surrounding country, and satisfied myself that Hunter while living on the plain had many inducements to study botany as well as geology, for he was among a subtropical flora, and at Lisbon had excellent opportunities for collecting specimens and adding to the knowledge of marine zoology he had acquired at Belleisle.

Hunter's domestic life was influenced in an important manner by the affairs of Portugal, for Home, surgeon to Burgoyne's regiment of light horse, became his friend. Returning to England, he got engaged to Home's daughter Anne. It was a long engagement, for they were not married till 1771. Mrs. Hunter's younger brother Everard became Hunter's house-pupil, then his assistant, and finally executor. Sir Everard Home and Matthew Baillie founded the Hunterian oration in 1813, and Everard Home was the first orator (1814).

EARL'S COURT.

On the conclusion of peace Hunter returned to London, a staff surgeon and deputy purveyor on half-pay. He took a house in Golden Square and started to practise. His half-pay, probably half a guinea a day, helped to pay the rent. He opened a room for dissecting, made teaching preparations, and, while waiting for patients, like many of us taught human anatomy for capital and comparative anatomy for interest. The classes were neither large nor lucrative, for he was not a good lecturer.

In 1765 he bought the lease of three pieces of land at Earl's Court, built a house, established a small menagerie, and made observations and experiments—

> On gizzards of gulls, hawks and owls,
> The heat of lizards, spurs of fowls;
> Bones of pigs, air sacs of eagles,
> Moaning dingos, barking beagles;
> Sleek opossums, prickly hedgehogs,
> Buffaloes, dormice, wolves and dogs.

Leopards and jackals lived in the den; stallions, sheep, goats, and rams occupied the stables. A mulberry-tree furnished leaves for the silkworms, and St. John's wort supplied pollen for the bees. There was a pond for ducks and geese which laid eggs for the table and for embryological study.

Hunter made observation hives for the bees, discovered that their wax was a secretion, and left some excellent notes on the relation of vegetables to animal fat. With the aid of Ramsden's delicate thermometers he discovered the significance of the terms "hot-blooded" and "cold-blooded" animals. He would have been astonished to learn that muscular action is the main source of animal heat. Hunter failed to grasp the importance of measuring the temperature of the body for clinical purposes. Indeed, the value of the clinical thermometer was not appreciated until the middle of the nineteenth century.

Earl's Court remained a bachelor's residence for seven years. In 1771 John Hunter, aged 43, married Anne Home, aged 29, a charming, amiable, and accomplished spinster, who in due course added to the physiologist's paradise the most delightful of all objects of natural history—children. Mrs. Hunter had a brother, Robert Home, an artist, who painted a portrait of Hunter which eventually came into the possession of the Royal Society. In 1787 Hunter read a

paper before that society on some observations "tending to show that the wolf, jackal, and dog are all of the same species." The odd dog in the picture is supposed to be the offspring of a half-bred wolf bitch and an English mastiff. The dog died in 1782. The portrait represents Hunter about the age of 45. He describes himself at this period in a letter to James Baillie, his brother-in-law, as "one of the happyst men living" (1775), in spite of the fact that he had to raise money on the Earl's Court property, a fact concerning which Dr. G. C. Peachey has found unimpeachable documentary evidence.

Hunter was a resident at Earl's Court for thirty years. In 1877 the Royal College of Surgeons, and a few friends, placed a window to his memory in the north transept of St. Mary Abbot's Church, Kensington. One of the principal lights represents St. Paul in the island of Melita casting a viper off his hand.

THE MUSEUM.

Nothing is known of the time Hunter began to collect specimens with the definite object of establishing a comprehensive museum of comparative anatomy. The Museum owes its origin to the peculiar conditions under which medical education was carried on in London in the eighteenth century. Schools of anatomy were private ventures. It was necessary for a surgeon who owned and managed a school to illustrate his lectures with skilfully prepared specimens. Such preparations are more useful than diagrams, wax models, or drawings on blackboards, even when made with skill and coloured chalk.

Hunter made many preparations for his brother, and some exist in the Hunterian Museum at Glasgow, but when he returned to London in 1763 he brought with him specimens of natural history from Belleisle and Portugal, and they formed the nucleus of the comparative anatomy series. It is a fair inference that such specimens were collected for teaching purposes connected with his lectures, but the collection grew until it became a museum that could be regarded as a discourse on the human body in relation to the animal kingdom. Gradually its founder's ideas expanded, and he conceived that it would be an ample illustration of life exhibited in the vast chain of organized beings, living and extinct, by a display of the various organs in which the functions of life are carried on.

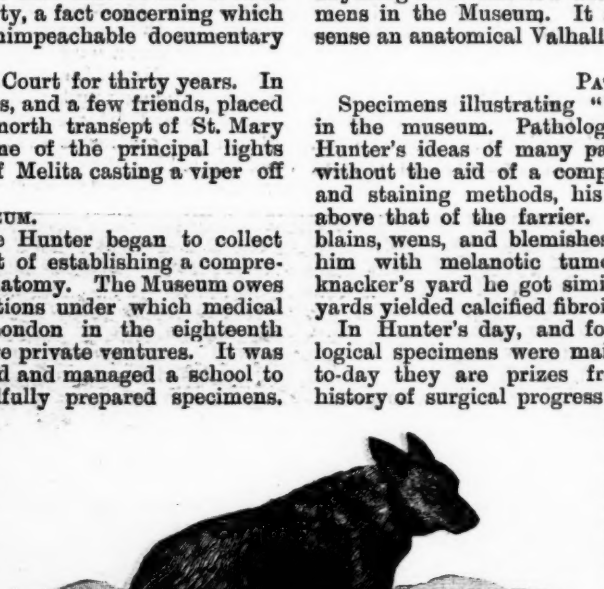

FIG. 6.—Alsatian bitch, whose pups had died, suckling six little pigs. (*Veterinary Journal*, 1920.)

In 1783 the lease of the house (42, Jermyn Street) which he had acquired from his brother William expired. He then took premises in Leicester Square and built his famous Museum. Sir Joshua Reynolds lived in the square, and the two men subsequently helped each other to what artists jokingly call immortality—one as subject, the other as painter. When Baron Grant furbished Leicester Square and laid out the garden in 1874 a colossal bust of Hunter was placed in one corner and a bust of Reynolds in another.

Hunter's example in collecting specimens was contagious. Blizzard, Astley Cooper, Heaviside, and other surgeons formed museums, but the specimens are dispersed. The care entailed in the upkeep and supervision of such museums is very great. Hunter's collection nearly perished. His executors, Matthew Baillie and Everard Home, when struggling young practitioners, with sound judgement retained the services of William Clift, who preserved the specimens from decay by the judicious use of two gallons of spirit occasionally. He had no books, so he read and made extracts from Hunter's manuscripts. The transcripts were made from some of the notes afterwards destroyed by Everard Home. They were published as *Essays and Observations* by Owen (1861). For seven years Clift received seven shillings weekly and meekly as wages. In return for these services he was made first Conservator when the Government bought the collection and entrusted it to the College in 1800. The Museum contains in orderly array big and little of every living thing Hunter could obtain: shrimps and sharks, tits and ostriches, shrews and whales; of the human kind dwarfs and giants. Animals now living on the earth were not enough—he must have fossil forms. When John White returned to England (1790) from New South Wales "the nondescript animals, Kangaroo, Tapua Roo, and Potoroo" were handed to Hunter for investigation. It is now so rich in specimens illustrating the anatomy of vertebrates, living or extinct, normal and abnormal, that no one who is prudent ventures to publish anything he thinks new without examining correlated specimens in the Museum. It abounds in surprises, and is in a sense an anatomical Valhalla.

PATHOLOGY.

Specimens illustrating "diseased action" were preserved in the museum. Pathology is a department of Biology. Hunter's ideas of many pathological processes were crude; without the aid of a compound microscope, section-cutting and staining methods, his knowledge of tumours was not above that of the farrier. Shepherds talk of corns, warts, blains, wens, and blemishes. The slaughterhouse supplied him with melanotic tumours from oxen, and from the knacker's yard he got similar things from horses. Graveyards yielded calcified fibroids and tumours of bones.

In Hunter's day, and for many years afterwards, pathological specimens were mainly spoils from the dead-house; to-day they are prizes from the operation theatre. The history of surgical progress during the last fifty years can be traced in the Museum catalogue. The hall in the Museum that enshrines Hunter's statue is a temple of pathology, admirably arranged and catalogued by Shattock. It should stimulate surgeons to study the science as well as practise the art of surgery.

EMBRYOLOGY.

Hunter's keen interest in monsters was not mere curiosity, but part of a great scheme for showing the phases of Life. The collection of Malformations in the Museum is the most comprehensive in the world. He was aware of the importance of a knowledge of the developmental stages of animals, and applied himself to study the chick. He studied geese because their embryos are bigger than those of fowls. He tried swans, but could not get eggs enough. He tried to obtain ostrich eggs, but only got two in thirty years, and made nothing out of them. The flock of geese for embryological work was kept at Earl's Court for thirty years.

Although he obtained much first-hand knowledge from this work, and some excellent drawings, he discovered little of importance, but left among his notes, awkwardly expressed—for masters of science are rarely masters of style—

Embryology indicates the steps by which the higher forms in a group of animals have been evolved from a lower.

Thirty years after Hunter's death von Baer discovered the human ovum, and realized that embryology is the key to the knowledge of the human body.

Hunter collected books but read little. Probably he never read the System of Philosophy written by Lucretius, although both men reasoned on inexplicable things:

LUCRETIUS: "Before the horns of a calf appear and sprout, he butts when angry and pushes passionately. But the cubs of panthers and lions' whelps already fight with claws, and biting, when their teeth and claws are scarcely yet formed."

HUNTER: "A duckling runs into the water the moment it sees it.

"A hen with ducklings seeing them run into the water is unhappy.

"A duck with chickens tries to induce them to enter the water; they run about the bank."

In relation to these paragraphs it may be stated that incubators and serial sections aided by the most exquisite stains throw no light on instinct. Though dogs and pigs do not interbreed, maternal instinct may be so strong in a bitch that she will suckle a sow's orphans (Fig. 6).

Pity is not an exclusive attribute of gods and men.

FEATHER-THICKETS.

In March, 1778, Hunter requested Jenner, his former pupil and friend, to watch a blackbird's nest, and remove the nestlings one by one on different days and preserve them in spirits in order to show the manner in which their feathers grow. He wrote details of the way in which the birds were to be treated, and Jenner carried out the instructions admirably, and the preserved nestlings are in good condition to-day (Figs. 7 and 8).

Forty years after Hunter's death Owen found among the MSS., transcribed by the faithful Clift, some notes on the situation of feathers:

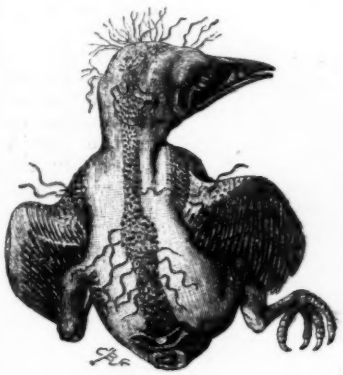

FIG. 7.—Callow blackbird. (Owen.)

FIG. 8.—Nestling blackbird. (Owen.)

> Although the feathers of birds appear to be an entire and uniform covering, they do not arise equally from every part of the body, but only from such parts of the skin as are least likely to be affected by the motion of the contiguous parts, such as the motion of the limbs. The feathers arise pretty equally on the head where there is no motion; and along the back, on the wings between joint and joint, and also on the thighs and legs, the whole making the bird a partial coat of mail. As they do not arise from every part of the skin equally they must be proportionally thickset where they do arise. The places of origin of feathers are very observable in a bird that has been plucked; but still more so in young birds just feathering, more especially of such as have little down, and of which the clump of feathers, from their colour, as in young blackbirds, present a great contrast with the skin. In the interstices of the clumps of feathers there are others disposed irregularly, but so sparingly as not to interfere with the motion of the part.

Hunter named each feather-thicket according to its situation. In 1883 Nitzsch, unaware of these observations, published a study of the distribution of feathers. He called the the thickets pterylae—feather forests—and the featherless spaces apteria.

The arrangement of feather-tracts (pterylosis) is now used as an aid in the classification of birds. Oken cast ridicule upon it; he could not refrain from laughter when he looked in Nitzsch's book, since the plates reminded him of plucked fowls in a poulterer's shop! We must admit that the idea is comic. Newton, referring to this joke, adds: It might as well be urged as an objection to the plates in many anatomical books that they call to mind a butcher's shop!

Hunter had his gibe at the systematists, for in his opinion natural historians are more pleased if they can class an animal than they would be if they could find any use such an animal would be to society.

The value of pterylosis in classification depends on the fact that feather-tracts, like beaks and feet, are modified by the habits of the bird.

These callow blackbirds are as instructive as a parable. They prove Hunter's skill as a museum expert. The contrast in colour—black and white—is excellent, and the skill shown in mounting them undeniable. They were prepared in 1788, and remained in obscurity until Owen found them nearly fifty years later.

Hunter had great power of observation, but lacked the gift of exposition. His discovery was like a lighted candle under a bushel. Half a century later Nitzsch detected the value of pterylosis and urged its importance in spite of ridicule. It is one thing to make a discovery, but it is another to make contemporaries accept it, or appreciate its value. It is as hard to establish a truth as to eradicate an error.

THE HORSE.

Hunter studied the horse carefully as an anatomist and as a surgeon. It was natural that he should study an animal that can walk quickly, amble easily, trot gracefully, or gallop with exceeding swiftness on limbs each of which ends in a modified toe, or finger, and in spite of many anomalies be so useful to man. He was thoroughly familiar with equine anatomy, the teeth especially; left a careful description of the curious guttural pouches connected with the pharyngeal ends of the Eustachian tubes, and discovered the conjugal ligament, which connects the heads of the ribs or opposite sides of the spine. This ligament, well developed in the seal (Fig. 9), is homologous with the thick transverse ligament that not only keeps the odontoid process of the axis in position, but excites curiosity in every student when he sees it for the first time.

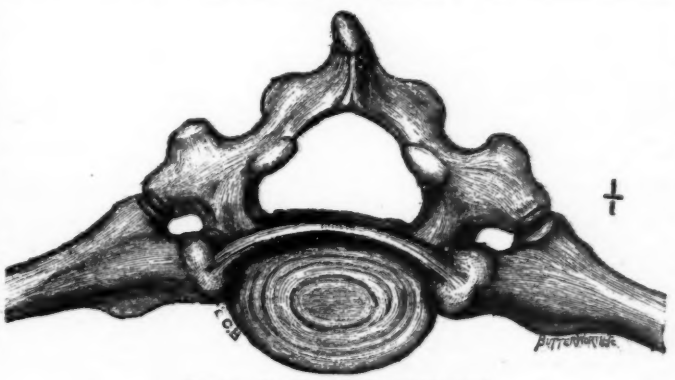

FIG. 9.—Conjugal ligament of a seal.

Hunter helped to found the Royal Veterinary College (1791); he was a vice-president, and with Cline served on a committee that approved of the appointment of Vian St. Bel as the first professor of the College. Among the first operations performed by St. Bel was one for the removal of "two accessory feet which grew from the fetlocks of the two forelegs." Hunter assisted and gave him some useful and friendly hints.

St. Bel died in 1793 from glanders. His early and unexpected death led to some difficulty, and Hunter, in order to help in the emergency, arranged for the students to have admission to the lectures of the leading teachers in the hospitals. The names mentioned in this connexion were Dr. Fordyce, Dr. Baillie, Cruickshanks, and Everard Home. The directors of the College sent Hunter a letter of thanks for this help, which he acknowledged in a letter from Leicester Square, October 2nd, 1793, exactly two weeks before he died. This letter long remained a treasured possession of that College but it has been lost.

Hunter's coach was drawn by a pair of bay stone horses. Jesse Foot, his detractor, saw these horses in Piccadilly returning from the funeral at St. Martin's Church. The circumstance recalled to his mind Virgil's account of the war-horse Aethon, in the funeral procession of young Pallas, shedding tears!

WHALES.

Whales are the biggest animals that exist or have existed on the earth, and their skeletons are the most impressive things in the Museum. Hunter recognized that whales are land mammals modified to live in the water. He dissected them when he got the opportunity and discovered their semicircular canal.

The organ of hearing in these huge mammals is modified in a remarkable manner. The pinna is absent; the meatus is narrow and, in some species, nearly obliterated. The tympanic is a shell of bone; the ossicles—malleus, incus, and stapes—are present. The tympanics are so loosely attached to the skull that when the bodies of whales decompose these bones

fall away. In the central Pacific detached tympanics, petrosals, and shark's teeth litter the floor of the ocean. Hunter studied the semicircular canals of fishes before he went to Belleisle, and it is reasonable to believe that the structure of the internal ear interested him for thirty years.

Lillie in 1910 and 1915 made some dissections of the internal ear of whales, and explains the vestigial character of the external auditory meatus by suggesting that whales hear through their nasal passage, which opens on the top of their heads. The nostrils collect the sound waves to be conducted through the blow-holes to the huge guttural pouches and the Eustachian tubes, thence to the tympanic bullae, which act as sounding boxes and transmit the sound waves to the chain of ossicles.

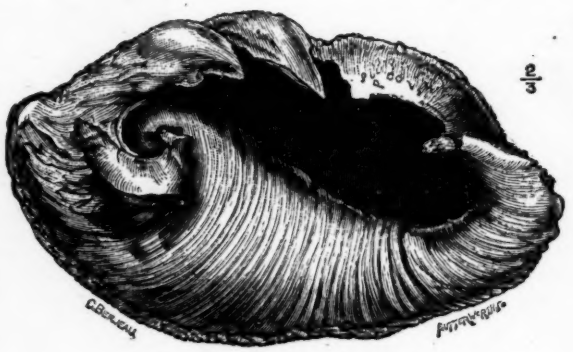

FIG. 10.—Tympanic of a whale.

The shell-like tympanic probably intensifies the sound waves in the water. There is no doubt that whales rely on the sense of hearing, and appreciate the pulsations caused by waves striking rocks, or the approach of an enemy. These shell-shaped bones are often kept as curiosities. One of them here is seen in Fig. 10; it was used as a paper-weight by a lady of fashion, yet it collected sound waves that enabled a mighty whale to move through unfathomable waters with the same certainty that the compass enables mariners to guide ships across the trackless ocean.

Intrepid whalemen who have watched whales in the solitary ocean regard them as timid and inoffensive, with large brown eyes and affectionate in disposition to their young. This character does not apply to the toothed whale. The killer whale has a large dorsal fin, and there has been much speculation in regard to its use. Herman Melville in *Moby Dick* states that the flukes of whales are tactile organs of great delicacy. I believe that the median fin of a killer is a tactile organ. On watching a killer rise to the surface, this dorsal fin is seen to rise like the periscope of a submarine (Fig. 11).

FIG. 11.—*Orca gladiator*. Though killer whales are evil-looking, they glide gracefully through the sea impelled by their powerful flukes.

Captain Wild has described to me tricks of *Orca* worthy of a crocodile. It is not easy for a killer to seize a seal on the edge of the ice, but he swims under it, and rising suddenly, breaks off a piece with the object of dislodging the seal. If the seal retreats, crafty *Orca* follows the animal as it lumbers over the ice and breaks off successive pieces in his endeavours to seize the creature. In such tricks the dorsal fin may be a reliable tactile organ like the whiskers of cats and the feelers of catfishes. Killer whales have formidable teeth, insatiable appetites, hunt in packs like wolves, and attack the biggest whales.

When Hunter died in 1793, and for many years afterwards, his skeletons of whales were the only examples existing in a museum in England. Imagine the enthusiasm of a surgeon actively engaged in practice, finding time for dissecting such huge animals, mounting their skeletons and housing them!

OPOSSUMS AND KANGAROOS.

Hunter kept opossums at Earl's Court, and about 1790, when he was studying the marsupials which John White brought from New South Wales, he wrote: "There is something in the mode of propagation in the opossums that deviates from all others." He kept many alive, "yet never could get them to breed."

The manner in which the foetus gets into the pouch, after puzzling naturalists for more than a century, has received a simple explanation for opossums and kangaroos. Goerling of Perth, Australia, discovered in 1906 that when the embryo is extruded from the vagina it is blind, but the arms are well developed, the fingers furnished with claws, and it can open and close its hands like the paws of a cat. The foetus, which makes its way through the fur to the opening of the pouch, enters, finds a teat and fastens itself on with the powerful lips (Fig. 12).

The little wanderer travels through the mother's fur, moving the arms alternately as in swimming, and leaves a track in the fur which lasts some hours. In the pouch the little fellow finds protection, warmth, and nourishment, and remains there till the eyes are opened and it has donned a fur coat; then, as many have seen with delight at the Zoo, the little kangaroo looks over the rim of the pouch and gazes with curiosity on the world at large, and in a way that would have amused John Hunter.*

FOSSILS AND OWEN.

Belleisle and Portugal had much the same influence on Hunter as South America on Darwin, especially in relation to geology, and with unexpected consequences, for few suspected his interest in fossils, although they were often sent to him, especially by Jenner. The discovery of Hunter's collection of fossils is one of the romances of the Museum.

When Richard Owen in 1826 started practice as a surgeon near the College, Abernethy, concerned at the neglected condition of the Museum, induced his old pupil to assist in cataloguing it. In this way Owen became acquainted with Clift and the collection. A few years later he married Clift's daughter, was gradually weaned from medical practice, and devoted himself to comparative anatomy. Whilst busy with the catalogue he unexpectedly found Hunter's store of fossils and displayed them in the Museum when it was rearranged in 1837. Startled by the number and variety of the specimens, he worked at them seriously. Nothing illustrates more thoroughly the parable of the sower than these fossils. Nearly all the seed sown by Hunter fell on stony ground, but some fell and grew in Owen's fertile brain. He dissected animals to enable him to study fossils, and became essentially a palaeontologist, revelling in the reconstruction of extinct creatures.

The Museum contains reconstructed skeletons of huge ground sloths; the gigantic armadillo with "an osseous coat in compartments," and the huge bird, the moa, towering over all. Skeletons of sloths, armadillos, turtles, crocodiles, ostriches, and emus stand in rows to demonstrate the truth of Owen's deductions. When these skeletons were mounted "evolution" and "mammalian descent" had not become the stock phrases of zoological zealots.

*C. G. Hartman discovered that the foetuses of the opossum (*Didelphys virginiana*) find their way into the mother's pouch in the same manner as the foetal kangaroo (*Anatomical Record*, 1920, xix, 25).

To-day zoologists include extinct as well as living animals in their lists. Before Darwin classification was a mania, since Darwin zoologists persistently endeavour to bridge gaps. Hunter's fossils turned Owen's thoughts to palaeontology and led men to take an interest in animals, huge and weird, that once moved about the earth and then passed into the twilight and silence of the past.

FIG. 12.—Young kangaroo hanging on the teat by its lips. (Museum, Royal College of Surgeons.)

THE ORATION.

A man who achieves greatness in any calling inspires others to follow his example. No man retains prominence unless he has impressed others to believe in him and magnify his name. Those who have been closely associated with a masterful teacher and speak well of him are often mockingly called disciples by his contemporaries. Many who during the lifetime of a great investigator or a reformer were detractors are often loudest in appraising him when dead. When our friends are alive we hesitate to say much about them in their presence—except in after-dinner speeches. As soon as they are dead we are apt, in a paroxysm of sympathy, to overpraise their work. Hunter was in advance of his time; his contemporaries could not appreciate the value of his work, and some of his later admirers overrate it.

The delivery of the Oration is justified. It is necessary to remind men of their benefactors; even the holiest saints require to have their names preserved by shrines, chantries, cathedrals, or festivals. Are there not saints' days in the calendar of every church—Protestant, Greek, or Roman?

Aesculapius had two famous sons: of these Machaon healed injuries, and Podalirius could recognize what was not visible to the eye and tended what could not be healed. They served with the army in the Trojan war.

FIG. 13.

Podalirius, returning from the war, was wrecked at Caria, Asia Minor. He had the good luck to cure a princess of falling sickness (probably hysteria), and in consequence acquired a great reputation. The Carians, after his death, built him a temple and paid him divine honours. This temple has long since disappeared, but his effigy survives on the College seal.

The essential work of Hunter's life was the useful specimens he prepared and left for successors. These specimens, safeguarded by faithful Clift, catalogued by sagacious Owen and Paget, and such able curators as Flower and Shattock, are now in the care of Keith, who lacks none of Hunter's enthusiasm but totally eclipses him in the art of exposition. The Museum was never in safer custody.

If I could believe the soul of man survives the dissolution of his body, I would believe the spirit of John Hunter haunts the galleries of this wonderful Museum, but I do believe his *influence is a quickening spirit among surgeons to-day.*

THE PROPERTIES OF CERTAIN "COLLOIDAL" PREPARATIONS OF METALS.

BY

A. J. CLARK, M.C., M.D., F.R.C.P.

(From the Pharmacological Department, University College, London.)

CONSIDERABLE attention has been paid during the past decade to the therapeutic action of metals in the colloidal form. The clinical literature associated with this subject is very extensive, and the results recorded are extremely remarkable; indeed, a cursory survey of the subject leaves the impression that colloidal metals act as specific cures for every known disease. The full claims of colloidal therapy will be found in the works of Searle.[1,2] Unfortunately the quality of this literature does not correspond to its quantity. Dale,[3] in a review of Searle's book, points out that the claims made there regarding the action of colloidal metals violate most of the known laws of physiology. The *Journal of the American Medical Association*[17] criticized Searle's report as follows:

"In a style as bombastic and verbose as the usual house-organ write up, the report recklessly details all sorts of conditions in which the so-called colloids—and particularly the Collosol brand—have been recommended, but derogatory findings are conspicuous by their absence."

An examination of the clinical literature further shows that the great mass of it is wholly uncritical, and that the few animal experiments and therapeutic observations which have been made with proper controls have mostly given negative results. Since the "scientific" literature on this subject is so uncritical, it is only natural that the manufacturers of colloidal preparations should have made rather startling therapeutic claims in advertising these preparations.

The author, at the invitation of the BRITISH MEDICAL JOURNAL, has investigated the properties of certain of the colloidal preparations advertised. The preparations investigated were certain of the collosols (The Crookes' Laboratories) and of the oscols (Messrs. Oppenheimer and Son, Ltd.). The preparations were bought in the open market, but care was taken to ensure that they had come recently from the manufacturers. The retail price of collosols varied from 2s. to 6s., and that of oscols from 2s. to 15s., a 4-oz. bottle.

Chemico-physical Properties.

The preparations contain in most cases 1 in 2,000 of metal, together with 0.6 per cent. of sodium chloride, and from 0.5 per cent. to 5 per cent. of organic matter. The organic matter in collosols is in some cases stated to be arabinic acid derived from gum arabic, and in other cases to be glutaminic acid derived from gelatin; in the patent specifications peptones are said to be used as the suspending agent. The organic matter acts as a protective to the colloidal metal and keeps it in suspension. Ultrafiltration showed that the organic matter was partly in colloidal form and partly in true solution, for the greater part of it passed through collodion membranes, but a part of it was retained.

The chief point to be determined was whether all or any of the active principles in the various preparations were in true colloidal suspension. The following are the chief tests by which colloidal solutions are distinguished from true solutions:

1. *Ultramicroscopic Examination.*—The ultramicroscope shows colloidal solutions to be full of microns, which appear as bright points undergoing rapid Brownian movement.

2. *Tyndall's Beam.*—A beam of light passed through a colloidal solution illuminates its path, just as a beam of sunlight in a darkened room is visible when the air contains dust or smoke.

3. *Kataphoresis.*—An electric current passed through a colloidal solution contained in a U tube causes the solution to move towards one of the electrodes.

4. *Dialysis and Ultrafiltration.*—Colloidal particles do not pass through such membranes as parchment or collodion.

5. *Diffusion.*—Colloidal particles diffuse into water much more slowly than do molecules or ions. Colloidal particles do not diffuse into gelatin.

These tests can easily be applied to pure solutions of colloidal metals, but the presence of a considerable quantity of organic matter in the preparations tested made them much more difficult to test.

The manufacturers apparently rely upon ultramicroscopic examination for determining the state of suspension of the metal, for they emphasize in their advertisements that the preparations show Brownian movement under the ultramicroscope, and state that this is evidence of the colloidal nature of the preparations. The absence of particles on ultramicroscopic examination is evidence of the absence of colloidal

matter; on the other hand, most forms of colloidal matter will show visible particles under the ultramicroscope. For instance, the ultramicroscopic examination of soapy water shows an extremely brilliant picture of microns in active Brownian movement. The ultramicroscope cannot therefore give any reliable evidence as to whether metals mixed with an excess of organic matter are in a colloidal state, for the particles seen may be metallic or organic; evidence may be obtained that probably some of the metal is in colloidal form, but it is not possible under these conditions to estimate how much of the metal is in colloidal suspension.

Kataphoresis also is of little value as a test for the physical state of these solutions. The passage of an electric current through these solutions caused a movement of the solution towards the anode, but this may have been due to the colloidal organic matter present.

Dialysis through parchment thimbles was next tried. The solutions were placed in parchment thimbles and were dialysed for six days. The results are shown in Table I. This test showed that oscol ferrum and oscol argentum were true colloidal solutions, for none of these metals passed through the parchment. In all the other cases examined a considerable proportion of the metal passed through the parchment. This suggested doubts as to whether these preparations were colloidal, but the test is open to the objection that the solutions may have oxidized on exposure to the air.

Külz[4] examined a preparation of colloidal arsenic and found that on exposure to the air free arsenious acid was liberated slowly; with a solution of 0.1 per cent. of arsenic in colloidal form, after three days' exposure to the air, 0.07 per cent. of free arsenious acid was liberated.

Ultrafiltration Experiments.

Since dialysis was inconclusive, ultrafiltration was employed. Collodion membranes were used. At first membranes were made from 7 per cent. collodion dissolved in equal parts of ether and alcohol, the membranes were made to fit Buchner funnels, and fluid was driven through under a pressure of two atmospheres. In later experiments collodion thimbles were made from 9 per cent. collodion in equal parts of ether and alcohol; the thimble was fixed to a rubber cork through which passed a glass tube, and a pressure of 100 c.cm. of water was used to drive the fluid through the thimble. In all cases the membranes employed were tested by filtering through them solutions of Congo red or haemoglobin, and only those membranes were used which retained 99 per cent. of these substances. About 5 c.cm. of fluid could be filtered in from one to three hours by these methods.

The colloidal preparations were tested by taking 20 c.cm. of the preparation, filtering through 10 c.cm., and then estimating the amount of metal in the filtrate and in the residue.

Iron preparations were estimated colorimetrically with ferricyanide. Arsenic and antimony were estimated gravimetrically by precipitating as the sulphide; in some cases arsenic was also estimated quantitatively by Marsh's test. Quinine was estimated by extracting the solution with chloroform and then estimating the residue obtained from the chloroform volumetrically by using Mayer's reagent as described by Schmidt.[5] Silver was estimated volumetrically with cyanide solution. The results of these experiments are shown in Table I.

TABLE I.

Preparation.	Amount of Active Principle stated to be present in—	Amount of Active Principle found on Analysis in—	Portion of Active Principle present which passed—	
			Collodion Membrane in Ultrafilter.	Parchment Dialysing Thimble (6 days' Dialysis).
Collosol antimonium...	Per cent. 0.01	Per cent. 0.09	Per cent. 25	Per cent. 30
Collosol arsenicum ...	0.1–0.2	0.15	47	60
Collosol ferrum... ...	0.05	0.05	100	90
Collosol quinine ...	1 0	0.9	80	85
Oscol argentum... ...	0.05	0.06	nil	nil
Oscol arsenicum ...	0.05	0.05	25	80
Oscol ferrum	0.05	0.05	nil	nil
Oscol stibium	0.05	0.04	23	75

The results shown in Table I indicate that the whole of the metal present in oscol ferrum and oscol argentum is in a colloidal form, and that it does not pass into true solution on exposure to the air. Collosol antimonium and arsenicum and oscol arsenicum and stibium all appear to contain a mixture of colloidal and non-colloidal metal, but on exposure to the air the metal tends to pass into true solution. Very little of the quinine in collosol quinine appears to be in colloidal form, and no demonstrable quantity of the iron in collosol ferrum appears to be in colloidal form.

Diffusion Experiments.

Further experiments were made to measure the rate of diffusion into water. Tubes 27 cm. long, with a diameter of 6 mm., were closed at one end and filled with water; the tubes could be inverted without the water escaping. A solution of collosol was put in a small bottle, a tube was dipped into the solution, the bottle closed with a rubber ring, and then left to stand in a dark cellar for sixteen days. At the end of this period the metal content of the solution within and without the tube was estimated. This method is a rough one for measuring diffusion, but control experiments showed a well marked difference between colloidal and non-colloidal substances. The results are given in Table II, and it will be seen that with non-colloidal substances the concentration inside the tube is about one-seventh that of the outside solution, whereas with colloidal substances the concentration inside the tube is only about one-seventieth that of the outside solution.

Oscol ferrum behaved like a colloidal solution, but collosol ferrum and oscol iodine behaved like non-colloidal solutions. The iodine content of collosol iodine was so low that it was impossible to measure it exactly.

Further experiments were made to test the rate of diffusion of collosol ferrum and other iron solutions into gelatin. A tube was half filled with 10 per cent. gelatin, and 5 c.cm. of solution were poured on top of the gelatin; at the end of a week the distance the colour had diffused into the gelatin was noted, and the quantities of iron in the fluid and in the solution were estimated. These results are shown in Table III, and it will be seen that collosol ferrum diffused into the gelatin like a non-colloidal solution of iron.

The results of the diffusion experiments confirm the previously expressed opinion that the iron in collosol ferrum is in a non-colloidal form; they suggest also that the iodine in oscol iodum either is not in colloidal form or else passes into true solution very readily. Collosol iodine is advertised as "Crookes' Colloidal Iodine," and the statement is made[20]—"Collosol iodine consists of a 0 2 per cent. colloidal solution of iodine." In a more recent publication[21] the statement is made—"Collosol iodine is a 0.05 per cent. colloidal solution of iodine suitably protected," and "Collosol Iodine Aqueous (Crookes)" is described as 1 in 500 (0.2 per cent.).

I have received the following report from the analyst selected by the BRITISH MEDICAL JOURNAL.

Analytical Report on Collosol Iodine.

I beg to report that I have analysed samples of collosol iodine, with results which show that it consists essentially of an aqueous solution of iodine with sodium chloride and gelatin.

The quantitative composition was found to vary in three bottles purchased on different occasions, but in no case was the iodine found to exceed that which could be dissolved by water containing the sodium chloride alone without the gelatin. The iodine, therefore, is present in the form of a plain aqueous solution of simple character; the addition of gelatin is without influence on its molecular nature or activity. Therefore the iodine is in no sense colloidal, nor indeed is there any colloidal quality in the preparation except the colloidal attribute of the dissolved gelatin.

The most notable effect of the gelatin in this composition is to reduce a part of the iodine to hydriodic acid, which becomes neutralized by the gelatin. The effect is visible as a loss of colour. Reference is made to the loss of colour in a separate label on the bottle, which states—

"If exposed to light collosol iodine becomes lighter in colour. The clinical efficiency is not affected, but for the sake of uniformity keep in a cool dark place."

The following are the analyses:

I.	
Free iodine	0.021
Iodine as iodides	0.009
Sodium chloride	0.737
Gelatin	0.315
Water	98.918
	100.000
II.	
Free iodine	0.023
Iodine as iodides	0.002
Sodium chloride	0.465
Gelatin	0.327
Water	99.483
	100.000
III.	
Free iodine	0.012
Iodine as iodides	0.014
Sodium chloride	0.215
Gelatin	0.213
Water	99.546
	100.000

These figures agree closely with my own figures. I tested three samples, and the highest figures I found on analysis were 0.025 per cent. of free iodine with 0.015 per cent. of combined iodine. This concentration was too low to allow its rate of diffusion to be tested with any certainty.

TABLE II.—*The Amount of Metal which Diffuses in Sixteen Days into a Tube of 6 mm. diameter filled with Water.*

Solution.	Concentration of Active Principle in Original Solution in—	Concentration of Active Principle after Diffusion in Fluid outside Tube in—	Concentration of Active Principle after Diffusion in Fluid inside Tube in—	Relative Concentrations inside and outside of Tube after Diffusion.
	Per cent.	Per cent.	Per cent.	
Non-colloidal Solutions:				
Potassium ferricyanide	0.1	0.072	0.01	1 to 7.2
Ferric ammonium sulphate	0.01	0.0083	0.0015	1 to 6
Ferrous ammonium sulphate	0.1	0.09	0.016	1 to 5.6
Iodine	0.127	0.09	0.013	1 to 7
Colloidal Solution:				
Dialysed iron	0.2	0.2	0.003	1 to 70
Solutions Tested:				
Collosol ferrum	0.05	0.047	0.006	1 to 8
Oscol ferrum	0.05	0.05	0.0005	1 to 100
Oscol iodum	0.16	0.09	0.0124	1 to 7.5
Collosol iodum	0.021	0.014	About 0.005	—

TABLE III.—*The Diffusion of Iron Salts into Gelatin.*
(5 c.cm. of a solution containing 2.5 mg. iron were in contact with gelatin in a tube 5 mm. in diameter for seven days.)

Solution.	Iron Remaining in Solution in—	Iron Diffused into Gelatin in —	Depth in mm. at which Colour was Visible in Gelatin.
Ferric ammonium sulphate	1.25 mg.	0.85 mg.	5
Ferrous ammonium sulphate	1.75 mg.	0.7 mg.	7
Dialysed iron	2.25 mg.	nil	nil
Collosol ferrum	1.75 mg.	0.43 mg.	15*

* This colour was, I believe, largely produced by the organic matter present.

PHARMACOLOGICAL ACTION OF COLLOIDAL PREPARATIONS.

A certain number of pharmacological tests were made to determine the action on living tissues of some of the preparations already mentioned.

Collosol Iodine.

The literature supplied by Messrs. Crookes suggests that the iodine in collosol iodine has an action on the body different from that of ordinary iodine. They state:

"The iodides have the disadvantage that being rapidly excreted they must be exhibited in large doses which often cause sickness, a foul taste in the mouth, and later, iodism with skin eruptions . . . collosol iodine is free from these defects."

Collosol iodine is, of course, very unlikely to cause iodism, for according to the analysis given above a litre of collosol iodine only contains 6 grains of iodine (free and combined), and the dose recommended by mouth of collosol iodine is from 2 to 8 c.cm.

I determined the smallest amount of iodide and of iodine which, when taken by mouth on an empty stomach, would cause the appearance of a demonstrable amount of iodine in the urine, and then determined the effect of corresponding amounts of the colloidal preparations of iodine. The results are given in Table IV. It will be seen that collosol and oscol iodine apparently suffer exactly the same fate in the body as does ordinary iodine.

TABLE IV.

Drug Administered.	Quantity of Iodine Administered.	Amount of Iodine Appearing in the Urine in Four Hours.
	Gram.	
Sodium iodide	0.008	Presence just demonstrable.
	0.016	Presence clearly demonstrable.
Iodine	0.02	Presence just demonstrable.
Collosol iodine (50 c.cm.)	0.012	Presence just demonstrable.
Oscol iodum (5 c.cm.)	0.008	None demonstrable.
" " (10 c.cm.)	0.016	Presence just demonstrable.

Colloidal Antimony and Colloidal Arsenic.

Cawston[6] and Wildish[7] claim to have cured leprosy with oscol stibium, and the total quantities of the preparation which they found effected a cure varied from 15 to 40 c.cm. These results are very remarkable, for 40 c.cm. of oscol stibium only contains 0.02 gram (1/3 grain) of antimony, and the quantity of antimony found necessary to produce cures in other diseases has been from 5 to 40 grains. Rogers,[18] who used colloidal antimony sulphide, recommended 2/3 grain antimony intravenously as a single dose.

Messrs. Crookes claim for collosol arsenicum that[19] "it is entirely non-irritant and does not cause any symptoms of arsenic intolerance; it has a very low toxicity while remaining therapeutically active."

Experiments were made, firstly to determine the minimal lethal dose of these colloidal metals, and secondly to determine the minimal dose required to exert a trypanocidal action. The minimal lethal dose and the minimal trypanocidal dose were determined by intravenous injection into mice. In case the protective colloids should have any toxic action on intravenous injection the minimal lethal doses on intramuscular injection in rats also were determined. These results are shown in Table V.

TABLE V.—*The Minimal Lethal Doses of Antimony and Arsenic Preparations.*

Drug.	Animal.	Mode of Injection.	Minimal Lethal Dose in Grams of Metal per kilo Body Weight.
Antimony Preparations:			
Tartar emetic	Rat	Intramuscular	0.012
Tartar emetic	Mouse	Intravenous	0.015
Oscol stibium	Rat	Intramuscular	0.02
Oscol stibium	Mouse	Intravenous	0.015
Collosol antimonium	Mouse	Intravenous	0.02
Arsenic Preparations:			
Arsenious acid	Rat	Intramuscular	0.006
Arsenious acid	Mouse	Intravenous	0.007
Collosol arsenicum	Rat	Intramuscular	0.017
Collosol arsenicum	Mouse	Intravenous	0.007
Oscol arsenicum	Mouse	Intravenous	0.01

The minimal lethal doses of non-colloidal arsenic and antimony agree with the results of other workers. Voeghtlin and Smith[8] found, by intravenous injection into rats, that the minimal lethal dose of antimony given as tartar emetic was 0.018 gram per kilo, and that the minimal lethal dose of arsenic given as arsenious acid was 0.0053 gram per kilo. Fargher and Gray[9] found that the minimal lethal dose of arsenic injected as arsenious acid intravenously into mice was 0.0057 gram per kilo.

Külz[4] found, however, that the toxicity of a purified preparation of colloidal arsenic was far less than that of arsenious acid. The minimal lethal dose of arsenious acid injected intravenously as arsenious acid in a rabbit is 0.005 to 0.007 gram per kilo, but Külz found the minimal lethal dose of his preparation under these conditions was 0.03 to 0.035 gram per kilo. These results lead to the conclusion that colloidal arsenic is about one-sixth as toxic as arsenious acid.

Table V shows that the collosol and oscol arsenic and antimony were nearly as toxic as non-colloidal solutions on intravenous injection, but that the former were about one-half as toxic as the latter on intramuscular injection. The results with intramuscular injection may be due to the organic matter in the colloidal preparations hindering absorption. These results confirm the conclusion that a considerable proportion of the arsenic and antimony present in these preparations is in true solution, and suggest that the remainder is rapidly converted in the body into true solution.

The trypanocidal action of these substances was tested upon mice infected with *Trypanosoma equiperdum*. The trypanosomes were kindly supplied by Dr. C. M. Wenyon of the Wellcome Research Laboratory. The mice were infected with 0.1 c.cm. of the blood of a heavily infected mouse; this infection produced in most cases a trypanosome count of from 100,000 to 300,000 trypanosomes per cubic millimetre of blood after three or four days. Untreated controls died in all cases within ten days, and usually within seven days of the infection.

The minimal dose of arsenic or antimony which cleared the blood of trypanosomes after four days was determined. The results are shown in Table VI.

TABLE VI.—*The Trypanocidal Action of Antimony and Arsenic Preparations Injected Intravenously into Mice Infected with T. equiperdum.*

Drug.	Minimal Curative Dose in Grams of Metal per kilo Body Weight.	Minimal Lethal Dose in Grams of Metal per kilo Body Weight.	Ratio M.C.D. to M.L.D.
Antimony Preparations:			
Tartar emetic	0.003	0.015	1 to 5
Oscol stibium	0.0076	0.015	1 to 2
Collosol antimonium ...	0.01	0.02	1 to 2
Arsenic Preparations:			
Arsenious acid	0.006	0.007	1 to 1.2
Collosol arsenicum ...	0.005	0.007	1 to 1.4

The results in Table VI show that in mice tartar emetic is superior to either collosol antimonium or oscol stibium as a trypanocidal agent, and that there is no pronounced difference between the activity of arsenious acid and collosol arsenicum.

The minimal curative doses obtained for tartar emetic and arsenious acid agree fairly well with those obtained by Voeghtlin and Smith.[8] These workers used rats infected with *T. equiperdum*, and obtained ratios $\frac{\text{M.C.D.}}{\text{M.L.D.}}$ of 1/4 for tartar emetic and 1/1 for arsenious acid. These results show that these special preparations of arsenic and antimony have much the same trypanocidal action as non-colloidal arsenic and antimony.

Toxicity of other Collosol Preparations.

The minimal lethal dose to mice on intravenous injection of various other colloidal preparations was tested. The results are shown in Table VII.

TABLE VII.—*Minimal Lethal Doses in grams of Metal or Alkaloid per Kilo Body Weight on Intravenous Injections into Mice.*

Non-colloidal Preparations.		Collosol.	
Substance.	M.L.D.	Substance.	M.L.D.
Quinine HCl	0.015	C. quinine	0.015
Mercuric chloride	0.01	C. hydrargyrum ...	0.02
Ferrous ammonium sulphate	0.05	C. ferrum	0.022
		C. argentum ...	0.015

The results in Table VII show that the collosol preparations tested have nearly the same toxicity as non-colloidal preparations of the same substances.

Heubner[10] found that with intravenous injection into rabbits the minimal lethal dose of the non-colloidal silver thiosulphate was 0.01 to 0.03 gram per kilo, while the minimal lethal dose of colloidal silver was 0.065 gram per kilo. That is to say that colloidal silver was less than one-half as toxic as an ordinary silver salt.

The Pharmacological Action of Colloidal Metals.

The facts as to the pharmacological action of colloidal metals have been obscured by various effects having been ascribed to them without adequate evidence, and also because many workers have used preparations which were to a large extent non-colloidal.

Metals in the colloidal form appear to exert only a feeble disinfectant action *in vitro*.

Marshall[11] prepared pure colloidal solutions of silver, and found that when tested over a period of ten minutes the colloidal silver had a disinfectant action only one-tenth as strong as silver nitrate. Marshall and Killoh[12] found that after *B. coli* had been covered with undiluted collosol argentum (1 in 2,000 silver) for ten minutes a vigorous growth resulted when the solution was removed; on the other hand, silver nitrate killed *B. coli* in five minutes at a dilution of 1 in 2,000,000. These results tend to show that colloidal metals will not exert a rapid disinfectant action.

Colloidal metals, if left in contact with bacteria for prolonged periods, will, however, act as efficient antiseptics. Simpson and Hewlett[13] found that on a twenty-four hour exposure collosol argentum acted as a disinfectant at a dilution of 1 in 200,000. This action of colloidal metals is, I think, probably due to their slowly breaking down and liberating free ions. Since metals in the colloidal form are non-irritant, this slowly exerted disinfectant action may be of considerable therapeutic value.

Fate of Colloidal Metals in the Body.

The suggestion is often made that metals in the colloidal form will continue to circulate for a long time in the blood; this is incorrect, as several workers have shown. Duhamel[14] found that when colloidal silver was injected into a rabbit 60 per cent. of the metal injected was fixed in the liver within fifteen minutes. Voight,[15] in similar experiments, found that after three hours 81 per cent. of the silver was fixed in the liver, and that none remained in the blood. It appears from these experiments that colloidal metals will not circulate in the blood and act there as a disinfectant for more than a few minutes.

The results recorded in this paper concerning the action of collosol and oscol antimony and arsenic lead me to conclude that these are not superior as trypanocides to non-colloidal preparations; these results are inconclusive as regards the relative merits of colloidal and non-colloidal preparations because the proportion of colloidal metal in these preparations is uncertain. Külz[4] found that arsenic in purely colloidal solution was not superior to arsenious acid as a trypanocide in rats.

The chief therapeutic action of colloidal metals when given intravenously appears to be that they produce a general reaction similar to that produced by the injection of peptones or non-specific vaccines. Petersen[16] classes colloidal metals amongst the agents which produce "protein shock," and considers their use as a particular example of non-specific protein therapy. Since many of the collosols and oscols contain breakdown products of proteins in considerable amount as protective colloids, the injection of such preparations is particularly likely to produce the reaction known as protein shock. Unfortunately our present information as to the value of non-specific protein therapy is so vague that the knowledge that colloidal preparations may belong to this class of preparation gives little exact guidance to their therapeutic value.

Summary.

The physico-chemical tests employed indicated that the active principles of some of the "colloidal" preparations investigated were entirely in the colloidal form; in other cases the active principles were partly in colloidal form and partly in true solution; whilst in some cases the whole of the active principle appeared to be in true solution. Previous criticisms of the physico-chemical properties of some of these preparations have appeared in the *Journal of the American Medical Association*.[17]

The pharmacological tests employed failed to show any marked difference between the action of the "colloidal" preparations tested and the action of the same substances in true solution.

Note.—The expenses of this research were defrayed by a grant from the British Medical Association.

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FIVE CASES OF DIABETES MELLITUS IN YOUNG CHILDREN.

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THE occurrence of five cases of diabetes mellitus in young children admitted within a short interval to one ward in a hospital leads me to think that at the present juncture in the history of this disease their publication may be of value. It is clear from the present literature that, for those who have few opportunities of studying a malady which is fortunately rare in childhood, it will be of importance to recognize the symptoms and, above all, the course of the disease at this early age, in order to obtain a correct perspective of the value of treatment by pancreatic extracts. It is in childhood that we see the pure type of virulent diabetes, and if very different results from those recorded in this series are obtained in the future there must be conviction that a great step forward has been made in medical knowledge. These cases were treated upon what until recently was considered to be the modern lines, and with the assistance of Dr. Spence and Dr. Donald Paterson, good medical clerks and devoted nurses, a whole-hearted attempt was made to study the effect of dietetic treatment and of such pancreatic extracts as were then available. The first case was an example of the type of problem that confronts us in hospital, and it will serve as an introduction to the main subject.

CASE I.

A boy aged 7 years was admitted on September 5th, 1920, in a state of coma. He had suffered from diabetes for eleven months, and for four months had been under "a specialist," and was sent to us when comatose. If we turn to this boy's history we find it is a characteristic one. An only child of healthy parents, he had been for the first time attending school. For two weeks, though complaining of headache and thirst, he tried to do his work and then had to stop. For six months these two symptoms remained the prominent ones, but later others were added—hunger, irritability, constipation, and polyuria (5 to 6 pints per diem). His weight at first hardly altered. The final symptoms were increasing thirst; emaciation, some vomiting, abdominal pain, and fleeting pains in the limbs. Finally drowsiness and coma.

On admission he smelt strongly of acetone and was comatose. The action of his heart was feeble and his face grey. The abdomen was scaphoid, and the urine contained 2.2 per cent. of sugar. Death was sudden.

Among these symptoms I should dwell upon irritability as one which repeatedly appears in the young when the disease is making headway, and upon abdominal and other pains as occurring just before the onset of the coma.

There was no necropsy, and a more unsatisfactory case than this for all concerned can hardly be imagined. The second case was much more instructive.

CASE II.

C. N., a boy aged 5½ years, was admitted on December 11th, 1919, with a history of symptoms of two months' duration. These symptoms were thirst, nocturnal enuresis, and occasional pain in the upper part of the abdomen. The sugar had been detected three weeks before admission, when the boy was attended by a doctor for colic due to eating green apples. Unless an attack of measles in June, 1919, could be claimed as a factor in causation, there was not a single event in the boy's history to suggest a cause for the diabetes.

I dwell for a moment on the symptom of nocturnal enuresis. We see many cases of this disability, but very few are due to diabetes. It is, then, very unfortunate if one should overlook testing the urine thoroughly in a case of nocturnal enuresis and happen upon a diabetic child. This boy was well nourished and walked into hospital. His skin was dry and his tongue beefy. The knee-jerks were present but difficult to obtain; the fundi were normal. The urine had a specific gravity of 1042, was acid, contained 6 per cent. of glucose, and also acetone and diacetic acid.

Treatment.

His appetite was poor. He was placed on a low diet of tea, bovril, two eggs, and some minced meat. The calorie value of this diet was about 250, and in four days the urine was free from sugar, acetone, and diacetic acid.

We then started to test his carbohydrate tolerance, and by December 30th we had reached a diet of calorie value 914, which contained 78 grams of carbohydrate. The weight of the boy was 18 kilos, and accordingly the calorie value per kilo was $\frac{914}{18}$ = practically 50 calories per kilo. Authority has stated that 40 are sufficient to maintain weight, but this boy barely held his own when in bed on 50 per kilo.

On January 1st we let him get up on the same diet for three days, and his weight increased, but a slight trace of sugar appeared in the urine. He returned to bed, whereupon the sugar disappeared, but his weight began to fall again.

By January 18th we had increased his carbohydrate tolerance to 86 grams, but after four days there was a slight trace (under 0.5 per cent.) of glucose. We accordingly decided that his carbohydrate tolerance was about 80 grams.

We then turned our attention more particularly to the fat tolerance, which we raised to the limit of 110 grams. During the next month we made tentative experiments in dieting, with these obvious points in view:

1. To obtain a diet which his parents could give him when he left hospital—one, that is to say, not too expensive for their resources, and fairly satisfactory for the boy.
2. A diet which, while keeping him sugar-free, maintained his weight.

This, whatever may be the opinion of others, is, I am convinced, very essential. We must try and maintain the weight in children. "Keep them thin" may be a motto for adults, but not for children. His diet finally had a calorie value of 836, but this would only admit two small slices of bread and two tablespoonfuls of milk pudding.

We failed—though the value of 46 calories per kilo body weight was attained—to maintain his weight in hospital, and after a long stay we sent him out with a fair diet On admission he had weighed 2 st. 11 lb.; on February 15th, 1920, he weighed 2 st. 9 lb.

The diet for guiding his parents when he was at home was:

Breakfast.—One egg, one buttered rusk, and an ounce of bacon.
Lunch.—Clear broth, one buttered rusk.
Dinner.—Mince 2 oz., cabbage 6 oz., potatoes 2 oz.
Tea.—One orange, one cup of milk, one buttered rusk.
Supper.—One buttered rusk, one cup of cocoa.

This was the skeleton outline—fish and other vegetables could be substituted—and it was useful as a working basis.

Three weeks later he was readmitted, with urine specific gravity 1039, glucose 3.9 per cent., and a faint trace of acetone. We ascribed this to eating too many vegetables. He had gained weight.

Once again in hospital we had difficulty in getting him to maintain weight, but on a diet of 926 calories he just held his own. In a month, however, he was able to take 122 grams of carbohydrate and a diet of 1,124 calories, on which he had gained a pound. The urine (specific gravity 1014) was free from sugar and ketone bodies.

From March 31st to August, 1920, he lived at home and kept well but did not gain weight. Then he broke down with hunger, thirst, irritability, and polyuria. There was sugar but no acetone in the urine. He was admitted on August 28th, when only a trace of sugar was demonstrated. This time the specific gravity of the urine was never above 1026, and only traces of sugar and acetone appeared when we were building up his diet. The result on this occasion was encouraging, and he left the hospital in October, 1920.

About Christmas he became thirsty, lost strength, and suffered from polyuria. Alarm was aroused three days before he came to the hospital by a "bilious" attack and drowsiness.

On admission he looked ill and drawn, and his urine was loaded with ketone bodies and sugar. There was general abdominal tenderness. In spite of intravenous alkaline injections he died that night in severe convulsions.

The *post-mortem* examination naturally interested me greatly, for I had never had an opportunity of seeing one in a child after so protracted an attack of diabetes. His illness had extended over almost three years. As usual there was very little to see and no long description is needed. The liver was large, pale, and flabby; the kidneys appeared natural. The pancreas was small and soft, and microscopy showed no increase of fibrous tissue but atrophy of cells. The gland looked exhausted, and the cells of the islands of

Langerhans were atrophied and separated by connective tissue.

We know that much caution is required in interpreting *post-mortem* changes in the pancreas owing to the autolysis that occurs after death, but this was a clear case of atrophy of the pancreas.

The third case was of especial interest because there had been a history of only one week's illness.

CASE III.

A girl aged 9 years was admitted on February 23rd, 1921, for sudden thirst, rapid wasting, and a nasty taste in her mouth. She had always had good health, and this was her first illness of any kind. Both her parents were healthy, her father aged 34, her mother 36.

The patient was thin and languid, passing 20 oz. of urine of a specific gravity 1042, containing 8.6 per cent. of sugar and ketone bodies. We put her on equal parts of milk and water, with a calorie value of 381. The sugar and ketone bodies disappeared, the urine falling in specific gravity to 1020; weight 3 st. 4 lb. Then we rebuilt the diet up to one of over 1,000 calories, and she gained steadily—leaving, sugar-free, in April. In June she was still sugar-free.

In September, 1921, she "caught a cold," and a fortnight later, being weak and generally ill, her urine was examined and found to contain sugar, and she was brought to hospital on September 24th. The child seemed quite ill and looked pale. Urine: specific gravity 1040, 2.9 per cent. sugar, ketone bodies present.

After admission she was very quiet and refused her food, and on September 28th fell into coma with profound collapse, dying early on the morning of September 29th. Efforts were made with an intravenous injection of a 2 per cent. solution of sodium bicarbonate—large doses by rectum—and drachm doses of glucose to restore her balance, but she never rallied.

Post-mortem examination was refused.

Here was a very remarkable and treacherous case. The first attack came like "a bolt from the blue," swift and threatening. The crisis passed and no case seemed to be doing better, for there was steady gain in health and weight and disappearance of the sugar. For months the child seemed well—and then came an infection in the shape of a "cold," and once more the swift onslaught. It was possible that the few days in hospital before death were not managed to the best advantage, but I do not think that this made any essential difference to the final issue. We must be wise indeed if, with scant opportunities for seeing diabetes in childhood, we can always anticipate an attack of coma.

Watching a series of these cases would convince one that there is something more than diet involved in these sudden relapses. Not for one moment do I suppose that, good though these children were and devoted their parents, it is probable that a strict diet can be maintained. One of the children was a member of a working man's large family—can one believe that the children did not have pity upon the sister whose diet was so dull, and provide her with occasional treats? Granting this, children who left hospital losing ground in every way actually improved in some instances at home. The breakdowns were more mysterious than a matter of diet—for example, when the weather became cold and treacherous and there were sore throats and coughs, my various cases would come back within a week or ten days with sugar in the urine. Three came back into the ward within a week, although from different families and different localities.

CASE IV.

My next case, a boy aged 8 years, had been suffering from lassitude, weakness, thirst, and polyuria for eleven months. His condition first attracted attention by his general weakness after he returned from school.

He was admitted to hospital in September, 1919, in what as the sequel showed was to be a feature of his case—an acute condition of acetonaemia. I did not see him then, and can only record that he went out improved. He appeared to have kept well, and certainly gained weight for nine months, when, fourteen days before he came under my supervision, he became irritable, weak, sleepless, and suffered from polyuria.

His second admission to the hospital was August 9th, 1920. The only history we could get was an injury to his right calf before the first symptoms of the disease commenced. The parents were healthy, as also was his only sister.

This boy was a very home-sick one, and on his readmission he had an acetonaemic attack, with vomiting. The specific gravity of the urine was 1010; it contained no sugar, but great excess of ketone bodies.

In this case it was urgent to control particularly the fats, and as the ketone bodies diminished a little sugar appeared and the child lost weight. The strict diet soon got rid of sugar and ketone bodies, but the loss of weight called for an advance upon this.

The blood was examined on August 24th by Dr. Spence, who found the blood sugar normal, but the curve a true diabetic one, as the chart exemplifies.

By August 27th he was so much better that we had him on a practically normal diet, except that bread and potatoes were cut down by half because of an occasional slight leakage of sugar. From the 19th to the 26th he was in fact on a good diet, free from all sugar and ketone bodies; but his blood sugar estimation, though giving a normal blood sugar content, showed after carbohydrate a true diabetic curve.

We eventually sent him out on October 12th sugar-free, though, in spite of every care, sugar would sometimes appear mysteriously in small quantities. I thought, in spite of the blood test, that we were going to have a successful result if we could only keep reasonable control of him when out of hospital. His diet was the following:

Breakfast.—Milk one glass, one egg, one rusk and butter.
Lunch.—One glass of milk.
Dinner.—Clear broth, mince, cabbage, potato.
Tea.—One orange, one glass of milk, one egg, one rusk and butter.
Supper.—One rusk and butter, one cup of cocoa, cheese, lettuce.

The boy kept well from October until the beginning of February, 1921, attending the hospital every fortnight.

In February, within a week he became irritable, drowsy, languid, and thirsty. He was admitted to hospital threatening coma, with sugar 4.8 per cent. and ketones in the urine, which had a specific gravity of 1040.

An interesting feature now was some bronzing of the face and a yellow discoloration of the palms of the hands. He was treated with skimmed milk, given glucose 2 drachms four-hourly, and large doses of sodium bicarbonate by the mouth.

He rallied well, and we raised him eventually to a diet of 1,616 calories, on which he just held his own. After two months in hospital he left with a sugarless and ketone-free urine in April. This time we had difficulty in ridding the urine of the ketone bodies, which made me uneasy as to the future.

Until August, 1921, he kept on the whole well, though leaking sugar at intervals, but at the beginning of this month he developed headache, polyuria, thirst, pains in the limbs, drowsiness, and deep breathing. The urine had a specific gravity of 1026, and was loaded with sugar and ketone bodies. The knee-jerks were absent. Treatment with stimulants, intravenous sodium bicarbonate, calomel, and sodium bicarbonate by the mouth saved him, but for several days his life hung in the balance. This time with all our efforts, and with occasional starvation days, we could never get him free from some sugar or acetone. He left the hospital in October, 1921.

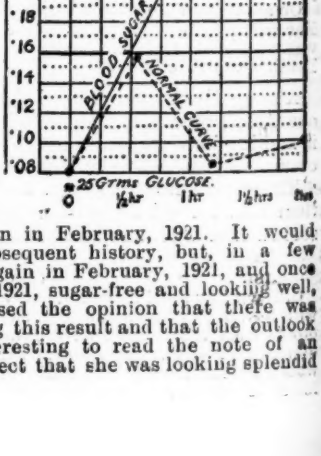
He left the hospital losing ground and in an apparently hopeless condition, but it would have been sheer cruelty to keep him longer away from his home, particularly as we were doing him no good. To my astonishment he then commenced to improve, and though not free from sugar kept well through the winter, until February, 1922—that is, for four months. Then all his symptoms reappeared synchronously with the formation of a small abscess on his scalp. He came to hospital on February 14th, smelling strongly of acetone, breathing deeply, and very drowsy. The urine had a specific gravity of 1032, and contained sugar and great excess of ketone bodies. In spite of every effort he died in coma on the 6th.

The *post-mortem* examination showed, as in Case II, a fatty liver, but the pancreas was shrunken and even more wasted than in the former case. Microscopy showed no active reaction, no trace of inflammatory change, but similar shrinking of the cells of the islets and relative increase of connective tissue.

CASE V.

The last case, a girl aged 7½ years, was admitted on May 28th, 1920. This case we got early, for there had only been three weeks' history. The symptoms were: inordinate eating and drinking, rapid wasting, and polyuria, the urine being noticeably pale in colour. There was not the slightest hint in the family or personal history, or in the surroundings, as to the cause of this sudden breakdown.

The child looked ill and was wasted, and suggested the diagnosis of diabetes. The specific gravity of the urine was 1045, and there was much sugar with ketone bodies.



By June 12th, on skimmed milk, with calorie value reduced to 513, and carbohydrate 52 grams, the sugar in the urine was reduced to a trace and the ketone bodies eliminated.

In July she was keeping free from sugar.

This child left hospital in October, 1920, free of sugar and ketones, apparently well, but with a blood curve of the diabetic type as shown by Dr. Spence. She kept well, but unfortunately ceased to come up to hospital for two months previous to her next admission in February, 1921. It would be wearisome to detail the subsequent history, but, in a few words, the child broke down again in February, 1921, and once more we sent her out, in April, 1921, sugar-free and looking well, but in the notes I had expressed the opinion that there was increasing difficulty in attaining this result and that the outlook was bad. In July it was interesting to read the note of an enthusiast below this to the effect that she was looking splendid and was sugar-free.

Shortly after this note, in the same month, she broke down again. In her case we had difficulty in raising the calorie value as there was some sugar appearing; and particular difficulty was experienced in trying to raise the carbohydrate tolerance. However, in September we had got the calorie value up to 1,546, carbohydrates 50 grams, and the patient had gained a little weight. On September 30th half a slice of bread brought back sugar, and later some mince produced the same result.

In October we managed to give one ounce of potato and a quarter of an ounce of bread, and a diet of calorie value 1,600. Now and again a trace of sugar would appear, but we then discharged her under supervision with the following diet:

Milk.—8 oz. every four hours.
Breakfast.—One egg, cheese 1 oz., two tomatoes, weak coffee, bread 1/4 oz.
Dinner.—Broth, cabbage, 8 oz., potatoes 1 oz., fish 2 oz., cheese 1 oz., one egg.
Tea.—Broth, one orange, lettuce 6 oz., cheese 1 oz., one egg.
Supper.—One egg, weak tea, an onion, bread 1/2 oz.

In 1921 a yellow discoloration was noticed on the palms of the hands and soles of the feet.

Once more she kept well through the winter—her mother taking infinite trouble—but broke down again in February, 1922. From that date onward she always appeared thin and drawn, but was out of hospital until the autumn, when again all the symptoms returned: diet proved ineffectual, and the child became very unhappy. It was apparent that the last stage was reached, and at urgent request she went home, dying in coma in November, 1922. There was no necropsy.

The experience gained from these cases was not unexpected, but was very disappointing, for we had all, according to our lights, worked most diligently at them; yet all five died within three years. In all the cases of any duration we invariably went through three stages of thought: first the belief that we were succeeding—a belief which was never confident; then the uneasy feeling that we were losing ground; and finally, the realization that our efforts were fruitless. We protracted the illnesses, but nothing more, and this very partial success was so unsatisfactory from the children's point of view that had not there been always a hope that some new advance might appear, or some unexpected improvement arise, it seemed hardly worth while.

The course of the illnesses and condition of the pancreas suggested to me an abiotrophy comparable to a myopathy.

That diet only touched the fringe of the problem seemed also beyond dispute. No doubt our methods were open to criticism—no dietetic therapy could escape this fate—but no criticism would alter, in my opinion, the essential fact that the disease was materially untouched.

The remarkable periods of comparative quiescence, the unexpected outbursts, and the sudden improvements under apparently less favourable surroundings, all pointed to a mysterious hidden hand working against us.

Finally, with new methods in sight, I would venture to repeat that this series of cases may be of some value to those with fewer opportunities to form a clear idea of new results. If, as we all hope, these are much more favourable in the diabetes of the young, they will be seen more clearly against this black background—painted, as it were, at the eleventh hour.

This fact, if nothing more, is to be learned from these cases—that even in the young, with careful dieting (and presumably some care will always have to be taken with the diet), sugar and ketone bodies may disappear for weeks and months. When I write "disappear" I mean this in a practical sense—namely, ordinary careful examinations at reasonable intervals compatible with workaday medical practice.

Any remedy may, then, produce this effect, or rather be coincident with it; but if this remedy in addition wards off acetonaemic attacks, or tides children over the sudden relapses, we shall be in a better position.

THE second international congress of military medicine and pharmacy will be held in Rome from May 28th to June 2nd, with General della Valle, Director-General of the Italian Army Medical Service, as president. The subjects for discussion include the relation of the transport service to the medical service; the collaboration between the civil and military authorities in matters of health, physical education, tuberculosis, venereal disease, alcoholism, etc.; disinfection and disinfestation in peace and in war; the treatment of chest wounds; and the scope and methods of chemical laboratories in relation to the army. Further information may be obtained from the Secretary of the Congress, at the Ministry of War (Direzione Centrale del Servizio Sanitario Militare), Rome.

REMARKS ON BOTULISM AS SEEN IN SCOTLAND IN 1922.

BY

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AND

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THE general circumstances attending the food poisoning tragedy at Loch Maree Hotel in August, 1922, became sufficiently familiar to the public through the agency of the press and the proceedings at the public inquiry; but as this outbreak was the first of its kind known to have occurred in Britain it has been thought advisable to describe its principal features, so far as they came under the notice of the medical observers. It will be borne in mind that the scene of the calamity was a remote spot some twenty miles distant from the nearest railway station, and ten miles from the residence of the nearest medical practitioner. Some of the victims and other guests had frequented the hotel in the fishing season for many years, and it was admitted by those who were in a position to know that the management and catering at the establishment were of a particularly high order.

All was well at bedtime on Monday, August 14th. On the morning of Tuesday, August 15th, six guests were suffering from nervous symptoms. On Tuesday afternoon one, and on Wednesday morning another, of the ghillies became indisposed, and thus the number of sufferers was increased to eight.

Before giving notes of the individual cases we may summarize the more general features of the illness as follows: The onset was with diplopia and unsteadiness on standing (less or none of the unsteadiness while lying in bed); palsy of ocular muscles (internal or external, or both); palsy of elevators of upper eyelids with contraction of frontales; inability to protrude the tongue; nasal or thick speech, or loss of speech; dysphagia; palsy of diaphragm; paresis of costal respiratory muscles; paresis of upper limbs and dorsal muscles of neck; complaint was made with regard to the throat (the patient pointing to the region of the larynx or of the pharynx); vomiting was severe in some cases, slight or absent in others; diarrhoea in some; in some cases complaint was made of abdominal discomfort or pain. There was no fever, no cough, and no disturbance of sphincters. The heart was normal; intelligence was preserved; there was little or no headache.

In most of the cases the illness began on the Tuesday morning with diplopia and unsteadiness on standing. The nervous symptoms were more obtrusive than the digestive; and, so far as was made out, the damage was confined to motor neurones, and mainly, if not solely, to lower motor neurones. The cranial nerves involved were apparently the third, fourth, sixth, ninth, tenth, eleventh, and twelfth. In certain cases there was involvement also of motor elements in the spinal cord, and particularly in the cervical region. It was surprising to note how completely the facial muscles appeared to escape, while their neighbours supplied from the brain stem above and below the facial nuclei suffered so severely. The condition of the face below the level of the eyes was therefore in striking contrast to that which is often seen in the victims of the Parkinsonian type of lethargic encephalitis.

One patient called attention to his lips, but it was not clear whether he referred to a motor or a sensory disturbance. No other sensory defect was recognized in his case, and, so far as could be ascertained by objective examination, the power of the orbicularis oris, if impaired at all, was not lost.

All the patients succumbed. The most fortunate were those who died on the first day, since they were cut off by rapid failure of the heart, with very little suffering. Those who survived for a day or two had the greatest physical suffering, and it was painful to witness how for hours, and while in full possession of consciousness, they had to maintain the struggle for breath which resulted from the paresis of the ordinary muscles of respiration; and to this cause of distress there was added the inability to see, to speak, or to swallow. Those who survived longest formed an intermediate group with respect to the amount of physical suffering.

Notes of Cases.

CASE I.

Male guest, aged 70. On rising from bed at 3 a.m. on Tuesday, August 15th, began to suffer from giddiness and double vision. He had also severe vomiting and diarrhoea. By the middle of the day he had difficulty in swallowing. Early in the evening speech was severely affected, and the general condition was one of collapse. He died at 8 p.m. apparently from cardiac failure, and without having suffered much from respiratory distress.

CASE II.

Female guest, aged 56. Began to have diplopia on Tuesday morning. About the middle of the day she vomited, and when she was seen shortly afterwards her tongue was dirty and her speech was difficult to follow. She was able to sit up in bed and did not look very ill. Later on she became unable to swallow. When seen about 10 p.m., she was lying quietly on her side, intelligent, and free from evident distress, but cyanosed in the face. Her pulse rate, which not long before had been 72, was now found to be over 130. She died about 11 p.m.

CASE III.

Male guest, aged 22. Could not see properly on Tuesday morning. He had diplopia while in bed, and on trying to rise felt giddy. When he complained of double vision squint was noticed by his friends, and he complained of discomfort in the mouth. Vomiting began in the afternoon. He could speak intelligently till 5 p.m. or later. Late on Tuesday night it was noted that the pupils were dilated. The fundi were easily seen and were normal. The patient was speechless, and communicated by writing, complaining of choking by spittle. The urine was abundant and of nearly normal colour.

At 3 a.m. on Wednesday some jerking of the arms was observed. When seen about 9.30 he was quite intelligent, and the pulse and breathing were normal, but he was unable to open the eyes properly, or to speak, or to swallow, or to keep up his head while sitting in bed. The knee-jerks and abdominal reflexes were absent. The diaphragm appeared not to be acting. Death took place at 12.30 p.m. that day (Wednesday, 16th).

CASE IV.

Male guest, aged 66. Began to suffer on Tuesday morning from double vision and giddiness. When he was seen at a late hour that evening his voice was very thick. The pulse rate was 80.

On Wednesday there was no movement of the eyeballs. The patient raised the eyelids with his fingers to see who was beside him. The right pupil was slightly contracted. The tongue could not be protruded. The knee-jerks and abdominal reflexes were absent. The pulse rate was 92. The voice was at length lost completely, so that the patient made signs in trying to communicate with others. Dyspnoea became severe and caused intense suffering, the patient being unable to lie down or to remain still even in a sitting position. Consciousness remained almost to the end, and hypodermic injections of morphine were the only means found to give temporary relief to the suffering. Death occurred at 9.30 p.m. on Wednesday, August 16th.

CASE V.

Female guest, aged 45. On getting out of bed on Tuesday about 6 a.m. felt dizzy and saw double. She had eaten potted-meat sandwiches about 1 p.m. on Monday, and was quite well when she went to sleep at 11 o'clock the same evening. When she was seen late on Tuesday night she had diplopia on looking to the left, dysphagia, slight defect of speech, and sluggishness of the pupils. She remarked spontaneously that she had been drowsy all day. During the ensuing night there was diarrhoea.

On Wednesday morning there was cyanosis. No movement of the diaphragm was detected. The hands were weak. The knee-jerks were normal, the plantar reflexes flexor, and the abdominal reflexes absent. Speech had become worse. There was vomiting of slightly fetid yellow material. The pulse rate was 92. The heart was normal.

For a brief period there was stridor suggesting abductor paralysis. Aphonia ultimately became complete. There was frequent complaint of the throat, and the patient often inserted her fingers into her mouth, with the purpose, as it seemed, of inducing vomiting, but without success. Inspection of the fauces showed no abnormality. Temporary improvements were observed in this case once or twice. In the later stages of the illness the muscles at the back of the neck were paralysed, so that the head hung forwards, and the upper limbs appeared to be seriously weakened. In the last few hours there was orthopnoea with restlessness and great distress referred to the throat. Consciousness was retained practically to the end, which took place at 4.5 a.m. on Thursday, August 17th.

CASE VI.

Ghillie, aged 35, was out with Case V and her husband on Monday, and with the husband alone on Tuesday. Before he left the boat on Tuesday afternoon he had begun to feel unwell. When he was seen late on Tuesday night he complained of his throat, and of pain and tenderness in the upper abdomen. The bowels had moved several times that afternoon. There was no diplopia. The temperature was non-febrile.

On Wednesday the speech was very thick. The tongue was dry, and was not fully protruded. There was pain at the throat, with inability to swallow either food or drink. There was no vomiting. The patient was quite intelligent, and communicated with others in writing. The left pupil was slightly larger than the right; both contracted to light. Lateral deviation of the eyeballs was defective. There was no nystagmus nor diplopia.

On Thursday he was seen about 6.30 a.m. He was unable to speak or to swallow. He was intensely restless and unable to remain either in the recumbent or in the sitting posture. He was eager to be removed by motor to his own home, some thirty miles distant, and his wish was respected. He died at 1.30 p.m., an hour after arrival.

CASE VII.

Male guest, aged 60, husband of Case II. Found on Tuesday morning that he was seeing double and that he staggered when on his feet. He told his wife about the double vision, and she said that she had the same symptom. The patient went rowing and fishing on the loch that day, hoping that the exercise would do him good, and he dressed for dinner in the evening.

Next day (Wednesday) he rose again, but in the afternoon he thought his speech was slightly affected, and he had decided ptosis. On Thursday he remained in bed, but was not obviously worse. For a day or two there were temporary improvements.

On Friday evening the voice was thicker; protrusion of the tongue was defective; movement of the palate was impaired but not lost; and there was ptosis on both sides. The external recti were weak, especially the left, and squint was perceptible, particularly when the patient looked to the left. Diplopia, however, was not now admitted. The pupils were of medium size and contracted actively to light. The movements of the facial muscles and the power of grasping were well preserved. The knee-jerks were normal or slightly increased. The plantar reflexes were flexor; the abdominal reflexes were absent. There was no disturbance of the bladder. The pulse was 84.

During the ensuing night the patient had a good deal of sleep, but on Saturday morning ptosis was complete and the voice was so thick that his speech was very difficult to understand. He tried to communicate with those around by writing, but in order to see the pencil and paper he had to raise the eyelids with his fingers, and then he found that he could not manage without his glasses, and an attempt to hold the eyelids up and to keep the glasses adjusted at the same time proved a failure. For a time it remained possible to detect a few words which he tried to whisper. In the afternoon he was seen by Dr. Brown Kelly, who found that sensation was preserved in the palate and posterior pharyngeal wall. There was reflex movement of the soft palate on probing with a wire, but there was no movement on phonation. The power of protruding the tongue was diminished but not lost. The patient called attention to the lips, but the muscles were not obviously paralysed, and it was not quite clear what the symptom was. He seemed also to indicate that his right upper limb was weakened.

On Sunday he was unable to swallow. During the ensuing night he was restless, but he did not have the intense respiratory distress noted in some of the other cases. He died on Monday, August 21st, about 1 p.m. The brain was removed by Mr. Colt, who sent one portion to Dr. Cruickshank of Aberdeen, and the other to the Scottish Board of Health.

CASE VIII.

Ghillie, aged 40 (boatman to Case I). Complained on Wednesday morning, August 16th, of abdominal discomfort on rising. There was sickness also in the morning, but not vomiting. In the course of the day he had a feeling of heaviness in the eyes, and saw double when he looked far ahead. Movement of the eyeballs was good, and did not induce diplopia. The pupils were of medium size and contracted to light.

When seen on Thursday he was in bed, but was not obviously worse. He spoke of some difficulty in swallowing, but there was no pain. The movements of the eyes seemed satisfactory. In the course of that evening or night he began to complain of his throat.

On Friday night he was complaining of pain near the lower angle of the left scapula. The heart, lungs, spleen, and superficial lymph glands all seemed to be normal. The area of hepatic dullness was somewhat reduced. The pulse was regular, 72 a minute. The tongue had a white fur. There was no vomiting. The bowels were constipated, but had been moved by enema. The tongue was protruded pretty well. There was very little movement of the palate, and the power of swallowing appeared to be reduced. The fauces were normal. The voice was thick. The movements of the face and eyeballs were satisfactory. There was no deafness nor tinnitus. The power of grasping was good. No noteworthy change was discovered in the reflexes. During the night he had a good deal of sleep. On Saturday morning he was unable to swallow, but was free from distress. The pulse rate was 70. The respirations were 19 a minute and were free from embarrassment. The tongue was dry. He was seen that afternoon by Dr. Brown Kelly, who found that the tongue could be protruded and moved sluggishly from side to side. The palate was motionless and showed no reflex contraction on probing. The power of swallowing was lost, and there was a gurgling sound in the throat owing to the accumulation of mucus, which could neither be swallowed nor expelled by coughing.

On Monday, August 21st, at 11 p.m., the patient died peacefully of cardiac failure.

Reckoning from 1 p.m. on Monday, the shortest incubation period was fourteen hours (Case I), and the longest about forty-three hours (Case VIII). The patient (Case VIII) who was the last to become ill and the last to die was boatman to the one who was the first to become ill and the first to die (Case I). As the ghillies may have eaten the poisonous food some time later than the anglers, the longest incubation period may really have been less than the forty-three hours.

Cases I and II died on Tuesday, August 15th; Cases III and IV on Wednesday, August 16th; Cases V and VI on Thursday, August 17th; and Cases VII and VIII on Monday, August 21st. The longest periods of survival from the onset of symptoms were six and a quarter days (Case VII) and five and a half days (Case VIII); the shortest were from fifteen to seventeen hours (Cases I and II).

Of the various means used to help the sufferers, the only one which gave any obvious benefit was morphine, and the relief was only of a temporary character.

With regard to the nature of this outbreak of illness, it was soon possible to set aside early suspicions as to the presence of poisonous berries in the black-currant tart consumed at dinner, and as to lethargic encephalitis. A careful inquiry as to the various articles of food consumed at dinner in the hotel, and at lunch on the loch, on the preceding day, showed that with one doubtful exception (subsequently found not to be an exception), the sufferers had all partaken of certain sandwiches made with potted wild duck. In the course of Wednesday, August 16th, we met in consultation with Dr. Maclean, M.O.H., and Dr. Brodie, school medical officer from Dingwall, Dr. Carnegie Dickson from London, and Dr. Cox from Preston; and all were agreed that the illness was due to food poisoning and that the potted meat was probably the offending substance. In course of time it became quite evident that botulism was the particular form of food poisoning with which we had to deal.

At the public inquiry held by Sheriff McIntosh at Dingwall on September 5th to 7th it was shown that some individuals who had partaken of the wild-duck sandwiches had not suffered any harm. This was accounted for by the fact that two pots of wild duck had been used for the sandwiches on the Monday morning. It also appeared that no other pot prepared by the manufacturers had ever been known to be harmful. The inquiry showed that the infection must have been in the pot when it left the factory, but it failed to show how or where the infection had taken place.

While the symptomatology was of itself sufficient for a diagnosis, there was a general feeling of satisfaction when it was learned that the results of laboratory investigations had removed any possibility of doubt. Dr. Cruickshank of Aberdeen gave evidence that the histological examination of a portion of the brain from Case VII was in accordance with the diagnosis of botulism, and Mr. Bruce White, B.Sc., of Bristol, working for the Scottish Board of Health, stated that he found *Bacillus botulinus* and its toxin in the remains of one of the pots of wild-duck paste.

Among the colleagues whose valuable co-operation we had in examining the patients, in trying to relieve their suffering, or in endeavouring to elucidate its origin, were Drs. Maclean and Brodie (Dingwall), Carnegie Dickson (London), Cox (Preston), Brown Kelly (Glasgow), Colt and Cruickshank (Aberdeen), and Dittmar and Leighton (Edinburgh); and, in addition, Mr. Bruce White (Bristol).

OBSERVATIONS ON THE CAUSE AND CURE OF CHRONIC RHEUMATISM.

BY

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HERNE BAY.

THE general characteristics of rheumatism, popularly so called, must be apparent to even the most casual observer. Everyone, I take it, will agree that rheumatism is a disease which is very prevalent, usually very painful, often very disabling, and always very liable to recur in spite of treatment. With such a picture presented to our view it seems strange that rheumatism of the chronic type has from time immemorial been treated with scant courtesy alike by writers of books and practising physicians. The references to this type of rheumatism in the textbooks are usually meagre in the extreme—as a rule the subject is mentioned merely to be dismissed in a few cursory words, while in practice any ache or pain which cannot be conveniently referred to any cause in particular is labelled "rheumatic."

So it happens that under the term "rheumatism" there have been grouped together a large number of conditions which bear a certain superficial resemblance to each other, as far as their external manifestations are concerned, but differ widely the one from the other when their fundamental nature comes to be investigated. They are due to widely dissimilar causes, and must therefore be considered to be different and distinct conditions. The result is that the term "rheumatism" has come to be very loosely used, and has come to denote a medley of symptoms rather than any definite disease.

The Nature of Rheumatism.

At the outset we are confronted with the all-important question—What is rheumatism? To this question it is essential that he who sets out to cure the ailment should be prepared to give as definite an answer as possible if he expects his efforts to be rewarded with success. Observation and experience extending over many years have led me to the following conclusions, among others, as to the nature of this disease.

1. That rheumatism is a definite disease.
2. That rheumatism is an infective disease due to the invasion of the part affected by a specific microbe—the *Streptococcus rheumaticus* of Poynton and Paine.
3. That the acute, subacute, and chronic types of rheumatism are variant forms of the same disease, the underlying pathological conditions and essential cause being the same.

To put the matter more concisely, rheumatism is a specific infective disease due to the *Streptococcus rheumaticus*. The validity or otherwise of this proposition I do not propose to discuss here, my present purpose being to show the practical results which may be achieved by adopting this proposition as a working hypothesis and a basis of treatment.

Basis of Treatment.

Every practising physician must be painfully conscious of the futility of trying to cure rheumatism by what may be termed the ordinary methods of treatment. These remedies, it is true, seldom fail to give temporary relief; but equally seldom they fail to prevent a relapse. To my mind, this inveterate tendency to recur in spite of treatment, which must be patent to even the most casual observer, must be considered the outstanding feature of rheumatism. That being so, it follows that any method of treatment which is capable of effecting a permanent amelioration or cure must be not only capable of breaking up the attack in being but also capable of preventing the occurrence of any prospective attack.

In other words, assuming rheumatism to be an infective disease due to a specific microbe, to effect a cure it is essential to compass the destruction of the microbes already lurking in the tissues, and to render the tissues immune to attack by other microbes which may subsequently gain access to the circulation. In the present state of our knowledge the only method of treatment which can be expected to fulfil these conditions is vaccine therapy.

Necessary Preliminaries.

Before, however, undertaking the treatment of a case of alleged rheumatism by vaccines or any other method of treatment it is necessary, as a preliminary, to make sure—or to make as sure as possible—that it is a case of genuine rheumatism with which we have to deal, and not one of its many counterfeit presentments. In other words, we must take pains to determine that the case in question is a true *Streptococcus rheumaticus* infection, and not some other form of infection which gives rise to similar manifestations. To this end all the various conditions which are known to give rise to symptoms closely resembling those of rheumatism should be closely considered and excluded. A careful study of the case in general, its history, course, symptoms, and physical manifestations, and, wherever necessary, the application of appropriate tests, will in the vast majority of cases lead us to a correct conclusion as to its true nature.

Vaccine Therapy.

Having determined the identity of the disease, and that it is a case suitable for vaccine treatment, the subsequent course is comparatively easy going. Practically the only difficulty which presents itself is the question of dosage. This must necessarily vary with the individual, and can only be determined by experience. If the initial dose produces an undue reaction, the subsequent dose should be reduced; if, on the other hand, no reaction is apparent, the subsequent dose should be increased; and so on until a dose is found which produces a minimum of reaction. In other words, the ideal dose is the maximum of vaccine which produces the

minimum of reaction. Once this is found the rest is easy. It is only necessary to repeat the dose week by week until such time as the symptoms have disappeared, or until no further improvement is obtained.

Circumstances of course may occur when it may be considered advisable to increase or decrease the dose or the intervals between the doses, temporarily or permanently. Every case must be treated on its merits.

Supplementary Treatment.

Let it not be thought for one moment that I am advocating vaccine therapy as the be-all and end-all of treatment. On the contrary, with rheumatism, as with all other diseases, no remedial measures should be neglected which help to bring about the best possible results. Experience, however, has led me to regard vaccine treatment as essential, and other remedial measures as subsidiary, but by no means unimportant, seeing that, in the vast majority of cases, they are usually desirable, and often necessary.

Symptoms of various kinds must be treated from time to time as they arise. The general health of the patient must be attended to, and every effort must be made to get him as fit as possible. The state of the digestive organs should be investigated and any tendency to indigestion rectified. The question of diet should not be overlooked, and, although it is seldom necessary to recommend an unduly restricted diet, it is often necessary to formulate a dietary suited to the digestive capacity of the individual. Speaking generally, a somewhat generous but plain and wholesome diet is indicated. Vaccine treatment seems to improve rather than diminish the digestive capacity. For obvious reasons it is essential to ascertain that the bowels, skin, and kidneys are functioning well, and, if not, to regulate their activity by appropriate measures.

Massage, active and passive movements, radiant heat, Turkish baths, resolvent applications, etc., should not be neglected, especially in the more chronic cases, which are often accompanied by much swelling and stiffness.

Such, then, is a brief outline of the method of treatment which I have been accustomed to adopt for some years past in cases of chronic rheumatism.

Analysis of Cases.

The results, which I have recently reviewed and been at pains to verify, are set forth in the following analysis. Only those cases are included in which sufficient time has elapsed to render them of any value in computing results, and in which the results are definitely known. An examination of the cases shows that, with few exceptions—which have not been included—they all fall naturally into five anatomical groups, as shown in the following tabular statement, which also shows the nature and number of the cases treated in each group, and the results obtained.

	Cases.
Articular rheumatism (arthritis)	52
Cured or markedly relieved	42
Slightly relieved or failed	10
Muscular rheumatism (lumbago 10, other forms 14) ...	24
Cured or markedly relieved	20
Slightly relieved or failed	4
Neural rheumatism (sciatica 6, other forms 14) ...	20
Cured or markedly relieved	15
Slightly relieved or failed	5
Pharyngeal rheumatism (tonsillitis)	12
Cured or markedly relieved	12
Cerebral rheumatism (chorea)...	4
Cured	4
Total number treated	112
Cured or markedly relieved	93=83%
Slightly relieved or failed	19=17%

Some explanation is necessary with regard to the terms used in describing results. "Cured" means that the symptoms have completely vanished, and that there has been no recurrence for upwards of a year. "Markedly relieved" includes cases of more recent date, which have remained well for from six to twelve months. "Slightly relieved" means that there was no very marked improvement in the condition, or what improvement had occurred was not permanent. "Failed" speaks for itself.

It should be noted that most of these cases were of long standing, and all had lapsed, or were tending to lapse, into the chronic phase, with frequent recurrences; and that the majority had been treated with the ordinary methods of treatment with little or no benefit. The following cases in epitome exemplify the type of case treated.

Articular Rheumatism.

Case 1.—Male, aged 35. Origin, attack of rheumatic fever. Duration, nine months. The condition when first seen included pain, swelling and stiffness of the hips, knees, and ankles; locomotion was only possible with the aid of two sticks; the general health was fair. After three injections the swelling disappeared; pain and stiffness were less; he was able to move about more freely, but still used a stick. After five injections, voluntary movements of the joints were free; he was able to get about fairly well, but his legs were still weak; he could not altogether dispense with a stick, but pain was practically gone; there was still some stiffness after resting. After eight injections all symptoms had gone; he could walk well and returned to work. He was under treatment for seven weeks.

Case 2.—Female, aged 66. Origin, subacute attack. Duration, six years. When first seen all the joints were involved; she was unable to do anything for herself, and was bedridden, with marked deterioration of health. After twelve injections she was able to get about and could use her arms and hands freely. Her general health was much improved, but she was still weak. After sixteen injections all symptoms had disappeared; she could walk well without assistauce and use her hands and arms for all practical purposes. Her general condition was good. She was under treatment for four months.

Lumbago.

Case 3.—Male, aged 47. Origin, subacute attack. Duration, three years. His condition included pain in the back, limitation of movements, and stiffness; the pain increased on movement, rendering locomotion difficult. After eight injections all symptoms had disappeared. He was under treatment for six weeks.

General Myalgia.

Case 4.—Male, aged 30. Origin, "chill." Duration, two years. When first seen he had general muscular pains, varying with changes in the weather, worse at night. After five injections the pain had gone. He was under treatment for four weeks. Note: This case is typical of the majority of cases of generalized myalgia treated.

Sciatica.

Case 5.—Female, aged 28. Origin, acute attack, attributed to sitting on a damp seat. Duration, three weeks. When first seen the attack was lapsing into a chronic phase. Ordinary remedies failed to relieve. There was pain along the course of the sciatic nerve trunk and its branches, increased on movement and pressure. She was unable to get about. After four injections all symptoms disappeared; the patient expressed herself as feeling just as well as ever. She was under treatment for three weeks.

Tic Douloureux.

Two cases of this painful and intractable ailment have been under treatment. In one case the result was completely successful, in the other it was a failure. The following is a brief epitome of the successful case.

Case 6.—Male, aged 65. Had always enjoyed good health, except for recurrent attacks of pain over the left eyebrow, which commenced five years previously; at first recurring about every six months, the intervals gradually became less and less. When first seen the attacks recurred every evening about 6 o'clock, persisted throughout the night, and passed off in the early morning, the patient being free from pain during the day. No previous treatment brought any permanent relief, and life was a burden. After four injections the attacks were less severe. After eight injections the attacks still persisted, but the pain was duller and bearable. After twelve injections the attacks, which had been getting less severe and less frequent, ceased. He was under treatment for two months.

Facial Neuralgia.

Three cases of so-called facial neuralgia, apparently of rheumatic origin, have been treated—two with complete, one with only partial, success. The former were cured after six injections at weekly intervals. In the latter, treatment was abandoned after three injections had been given.

Chorea.

Case 7.—Boy, aged 9. Duration, three months. When first seen there were marked involuntary movements of the arms and head, with twitching of the face; there was also a mitral bruit. After four injections the movements ceased. The patient was under treatment for three weeks.

Case 8.—Girl, aged 15. Duration, eight years. She had had recurrent attacks. The mental and physical conditions were much impaired; involuntary movements were general. After six injections the condition was much improved. The movements, which were severe, were now reduced to spasmodic twitchings. After twelve injections the movements had ceased; her physical condition was good, her mentality much improved. The duration of treatment was three months.

Tonsillitis.

These cases occurred chiefly in adolescents and young adults. In all there was a tendency to recurrence in the spring and autumn, and all were accompanied by symptoms elsewhere, which pointed unmistakably to their rheumatic origin. Otherwise there was nothing to differentiate them, superficially, from ordinary subacute attacks of tonsillitis. Treatment was carried out in the intervals between the attacks. Six injections were administered

in each case. Eight remained well for over a year, and the remaining four for periods varying from over six months to a year, all having passed the period at which a recurrence was due.

CONCLUSION.

In conclusion, it should be noted that the foregoing remarks are not put forward in any sense as a critical study, but merely represent a brief record of individual experience concerning a certain line of treatment, with its results.

TREATMENT OF ORIENTAL SORE BY PHOSPHORATED OIL.

BY

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THE treatment of oriental sore (dermal leishmaniasis) which I devised some time ago and have used in three cases during the last six months consists in injections of recently prepared phosphorated oil into the nodule and around it.

Method.—A sterile 20 minims all-glass hypodermic syringe is used; 5 minims of the oil are drawn in and injected into and around the lesion by inserting the syringe in two or three places into the nodule itself and under the skin around the periphery; if the lesion is ulcerated two or three drops of the oil, in addition, are dabbed on the fundus of the ulcer after removing the crust. The injections are given once or twice a week.

The result in all three cases has been very satisfactory, evidence of incipient healing appearing almost immediately after the second or third injection, and an apparently complete cure being obtained within three weeks to two months.

CASE I.

A demobilized army officer, aged 26, contracted oriental sore six months ago in Persia—one large non-ulcerated nodule and a partially ulcerated one, both on the left forearm. Microscopical examination of both lesions showed the presence of *Leishmania tropica* Wright. The patient had had severe malaria and had been treated with large doses of quinine. He had had no treatment of any kind for the sore. I gave him altogether seven injections (5 minims each) of phosphorated oil at rather irregular intervals, as he could not come to see me very regularly. The actual injections were painless; after a few hours there was a slight local reaction, the lesions becoming somewhat oedematous and the surrounding skin slightly reddened. Symptoms of rather severe general reaction occurred once; after the third injection the patient had fever (102°) and felt chilly and unwell, with rheumatoid pains all over the body. The symptoms may have been due in reality to his old malaria, as the temperature fell to normal with sweating within twenty-four hours; I could, however, find no malaria parasites in the blood. The open sore healed very quickly within two weeks, a smooth white scar being left; the non-ulcerated nodule took six weeks to disappear.

CASE II.

A young married woman (British), aged 24, presented on the left wrist a small smooth nodule with a few scales at the apex and no sign of ulceration. Microscopical examination showed it to be an oriental sore, contracted apparently two months earlier in India; the first sign of it appeared during the voyage home. Six injections of phosphorated oil (two a week) were followed by complete disappearance of the lesion within three weeks. The injections were never painful, the local reaction was very slight, and there was never any sign of general reaction.

CASE III.

An Englishman, aged 22, had contracted oriental sore seven months earlier in Iraq. There was one very large nodule on the left forearm ulcerated at the top and covered with a thick crust. Microscopical examination was positive. The patient said that the condition had been treated with intravenous injections of tartar emetic without any benefit; it had also been considered to be of syphilitic origin and treated with salvarsan unsuccessfully. He was given an injection of phosphorated oil (5 minims) twice a week into the nodules and at several places under the skin and around it. The lesion took two months to heal completely.

The method seems to have been successful in these three cases, which are all I have treated. The following points should be kept in mind: First of all, it is essential that the phosphorated oil should be of recent preparation; old phosphorated oil is inert. The phosphorated oil I have used is the oleum phosphoratum *B.P.* The injections are practically painless, but after a few hours there may be some local reaction, the lesions becoming slightly swollen and the skin around them somewhat reddened; apparently severe general reaction is rare; a reaction lasting twenty-four hours occurred after the third injection in Case I, but the patient was an old malarial subject, and the condition—though I did not find any malarial parasites—may have been malaria, especially as it terminated in sweating.

Phosphorus is a powerful poison, and its delayed action on the liver should especially be kept in mind; it should therefore be given with care, and every precaution taken. I may say, however, that though I have used injections of phosphorated oil in only three cases of oriental sore, I have used this therapeutic method without any ill effects in several other conditions, since I found, some years ago, that phosphorated oil given by subcutaneous injection was almost painless: I have used it, for instance, without any untoward effect in cases of rickets and of osteomalacia, and in certain cases of very chronic malarial cachexia as an adjuvant to quinine and arsenic.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

TRAUMA AND APPENDICITIS.

THE two following cases, in which appendicitis appeared to be the result of trauma, came under my care early this year; the injury in each instance occurred on January 2nd.

CASE I.

A young woman, aged 19, a field worker, was walking on the outskirts of a wood when she tripped on a stub and fell flat on the ground, but not upon any projecting object. On raising herself she felt sick and faint, but improved as the day advanced, took her evening meal, and slept well. The next day she felt pain just above the right groin, and could not take her food well. The father, thinking his daughter had received some injury from the fall, asked me to call on the following day.

I saw her at 3.45 on January 5th. She had abdominal facies, anorexia, and complained of pain in the right lower quadrant; temperature 103°, pulse 140. There was scarcely any movement of the abdomen, a resisting area in the right iliac region per rectum, and some tenderness on palpation high up.

From the history, I wrote a note to King's College Hospital (to which the patient was admitted) expressing the opinion that she was suffering either from a large haematoma commencing to suppurate or an acute appendix abscess.

Operation was performed the same evening, and the following note, from Mr. St. J. D. Buxton, assistant surgeon to the hospital, describes what was found: "She had a localized appendix abscess; it was shut off from the general peritoneal cavity with very firm adhesions, but the abscess was very offensive. I took the appendix away and drained the cavity. I took some trouble to avoid opening the general peritoneal cavity, and hope that will be rewarded, so I do not know if there was any free fluid in that. Your note regarding the fall was very interesting."

CASE II.

A farm labourer, aged 59, while standing astride a wooden pole slipped and fell, his whole weight coming on the lower part of the abdomen. He felt sick and faint, and went home. He resumed work the next day, and continued to work daily until January 8th. On this day the district nurse was called in; she decided that it was necessary the patient should see a doctor without delay. He was seen by Major S. H. Smith, who ordered enemata to relieve constipation, and a mixture for what was diagnosed as a reflex asthma. That night the nurse reported no result from the enemata, and proposed giving a high one. This was agreed to, and a request was made that a report on the state of the patient should be submitted early the following morning. No report came, and the patient was not visited again until January 12th. He had commenced to vomit the previous night (mucus and bile), complained of pain in the right inguinal region, and had had no action of the bowels since the high enema on January 8th. The abdomen was immobile and distended.

The patient was removed to Gravesend Hospital on the afternoon of January 12th, and operated on in the evening. A report from Mr. G. R. M. Cordiner states that "his abdominal cavity was found to be full of foul-smelling pus. On search being made, a gangrenous perforated appendix was found."

Farningham. T. F. HUGH SMITH.

FOREIGN BODY REMOVED FROM THE ORBIT.

MR. W. was taking an inebriated friend home, a misplaced kindness, which resulted in a severe blow causing a wound below the left eye. Next morning he consulted the local medical man, who stitched the wound, which healed by first intention. Four weeks later Mr. W. was sent to me, and was admitted to the Salisbury Hospital, Southern Rhodesia. There was a scar below the left lower eyelid, and external and superior strabismus on the left side, the eye being displaced outwards and upwards. There was also extensive herniation of the bulbar conjunctiva, which protruded between the lids and hung over the malar region. The pupillary reaction and tension were normal. There was

marked diplopia. Ophthalmoscopic examination revealed nothing abnormal; the fundus and media were clear. The herniated conjunctiva was excised; there was slight purulent discharge from the wound, which was opened, explored, and drained. Examination showed fracture of the orbital plate (superior maxillary) with displacement of fragments, and fracture of the lacrymal bone, but raised no suspicion of any foreign body. A second operation was undertaken ten days after the first, on account of short recurrent attacks of left fronto-temporal headache of a stabbing character. The orbit was freely exposed by opening and extending the original wound, following the anterior border of the orbital plate of the superior maxillary and malar bones. Fractures in accordance with the *x* ray report were found. The sphenoidal fissure was explored, revealing the rough edge of a foreign body, which gave an impression of a fragment of loose bone. This was grasped by sinus forceps, which slipped, and a portion of black material (vulcanite) was noticed on the tip of the forceps. The foreign body was then seized with bullet forceps and extracted. It proved to be 1¾ in. of vulcanite pipe stem, the lumen of which contained brain substance. The broken end projected into the orbit for about 1/8 in., the mouth end being embedded in the brain to the extent of about 1⅛ in. The edges of the sphenoidal fissure were fractured. The wound was closed, leaving a long drainage tube leading to the brain cavity. The operation wound healed rapidly, and the patient made an uninterrupted recovery. The eye regained its normal position with perfect movement, and binocular vision was restored. The point of particular interest in this case is that definite symptoms were absent until four weeks after the injury.

H. V. GATCHELL, F.R.C.S., D.P.H.
Salisbury, Southern Rhodesia.

Reports of Societies.

GASTRIC AND DUODENAL ULCERS.

A JOINT meeting of the Sections of Medicine and Surgery of the Royal Academy of Medicine in Ireland was held in the Royal College of Physicians on February 2nd. The President of the Surgical Section, Sir WILLIAM I. DE COURCY WHEELER, who was in the chair, said that the Council of the Surgical Section had arrived some time ago at the conclusion that it would be advantageous to arrange co-operation between that Section and the Medical Section. The latter had from time to time invited or accepted communications from individual surgeons, and leading members of the Medical Section had taken part in surgical discussions; but hitherto no formal or definite action had been taken by the General Council of the Academy to approve the principle of joint meetings and to announce such meetings in the official programme. The suggestion was well supported both by physicians and surgeons, and the result was the meeting now held to discuss the diagnosis and treatment of gastric and duodenal ulcers.

In opening the discussion the President said that there appeared to be a few central facts around which discussion might usefully revolve. Often the presence of a gastric ulcer could not be definitely ascertained unless an accident such as perforation occurred, or deformity produced by cicatrization is put beyond doubt by an *x*-ray picture. In cases of duodenal ulcer without deformity he had frequently obtained two *x*-ray reports in the same case which at first sight appeared contradictory. One report would state that there was pyloric spasm, some dilatation of the stomach, and gastric stasis; the next report that the pylorus was open and that the stomach contents were shot through by the action of a hypertonic gastric muscle. These apparent inconsistencies could easily be explained when it was remembered that pyloric spasm frequently disappeared when the patient was put to bed on restricted diet and took alkalis freely. The spasm passed off, but the stomach remained hypertonic and the contents were readily and forcibly propelled through an open door. It was therefore necessary to take into consideration whether a patient was at work without restriction or in bed under medical guidance. In the small acute ulcers of females he did not think that *x* rays were helpful, and he did not think either that these cases were suitable for surgical interference. He was of opinion that the presence of excess of hydrochloric acid in the stomach was not a characteristic sign of gastric ulcer. It appeared to occur frequently in the absence of ulcer, when pyloric spasm was well marked; but when ulcers were present in the region of the lesser curvature an increase in the amount of hydrochloric acid was not usually found. It was a fallacy to rely on the absence of hydrochloric acid in cases of suspected malignant disease. In half the cases where carcinoma arose primarily, or was grafted on a pre-existing ulcer, the presence of hydrochloric acid could be found; and, on the other hand, achlorhydria was sometimes but not frequently a feature in cases of ulcer of the duodenum. The significance of haemorrhage was all-important. They were all familiar with the haematemesis of biliary cirrhosis; gastric haemorrhage occurred frequently from pathological conditions of the pancreas, gall bladder, appendix, and Fallopian tubes, and other organs, without any lesion in the gastric mucous membrane. Oozing of blood from the stomach had been described by Hale-White under the term "gastrostaxis." In renal disease it was not an uncommon symptom. He believed that it was seen during attacks of gastric crises in tabes. Capillary oozing or bleeding from arterioles quite commonly took place in all these conditions. Under the term "toxic gastric haemorrhage" many such a gastric lesion were at one time thought to be examples of vicarious menstruation. The question of perforation needed passing mention. It could not be mistaken. The patient could tell to the moment when the catastrophe occurred, and could generally indicate exactly the position of the perforation. He never repelled the suggestion of immediate operation, and if he was not an alcoholic he became rapidly anaesthetized with ether, and never resented the fumes by a single movement. If the patient came for treatment some hours after the perforation, the shock had passed off, and he would apparently be better. The improvement probably coincided with the outpouring of the protective and defensive fluids of the peritoneum, which had been so vividly described by Murphy. Then the final stage came, with the facies hippocratica, the black vomiting, the pulse quickened, and the temperature rose. Lastly they got the clammy, bright-eyed, toxic patient, described ruthlessly by Murphy as being "more fit for an undertaker than a surgeon." The chronic recurrent ulcer needed surgical intervention, and if there had been haemorrhage before the operation there would be haemorrhage after the operation, in 12 per cent. of duodenal ulcers, and 8 per cent. of gastric ulcers, unless more than gastro-enterostomy was done. Ulcers were now, if possible, excised or destroyed with the actual cautery by Balfour's method. It was his own practice to burn them out. The greatest difficulty that arose at present was the knowledge that perhaps 40 or 50 per cent. of chronic ulcers in people past middle life changed their character and became malignant. He did not believe that gastrectomy was the operation of choice in cases which were known to be non-malignant at the time of operation, but in the hands of Moynihan and Sherren the operation did not carry increased mortality. In special cases he preferred gastrectomy, the first of which he published in 1910. Once gastro-enterostomy was performed the patient again became a medical case, and with proper dieting and the administration of alkalis for three months the results would be very different from those obtained in patients allowed to go their own way.

Sir JOHN MOORE said that the President's paper raised questions which were of equal interest to physicians and surgeons. He would like to know if the symptom of the disappearance of pain after taking food was reliable as differentiating a duodenal from a gastric ulcer. He suggested that when giving alkalis in connexion with hyperchlorhydria it was desirable to add a solution of bismuth and ammonium citrate.

Dr. SPEARES said that personally he had never got much help from *x* rays in either gastric or duodenal ulcer cases, and though he always had the patients radiographed he did not place much confidence in the results. Regarding alkalis in duodenal ulcer and gastric ulcer, he usually confined himself to Sippy's powder; it had always had good results. A duodenal ulcer presented peculiar difficulties. He would like to know in those cases where there was a perforation of the duodenum if it was necessary to do a gastro-enterostomy. Physicians met with a number of cases of gastric ulcer which yielded readily to medical treatment and did not require surgical intervention at all, but if there was any

suspicion of malignancy, or if the symptoms did not yield to treatment, operation should always be undertaken.

Dr. HARDMAN confined himself to the points on which radiographers tried to base their diagnosis of gastric or duodenal ulcer. The diagnosis of ulcers depended upon direct evidence and indirect evidence.

Direct evidence: (1) Niche, or ulcer crater; (2) accessory pocket; (3) organic hour-glass deformity.
Indirect evidence: (1) Spastic manifestations—(*a*) incisura, (*b*) spasmodic hour-glass, (*c*) diffuse gastric spasm; (2) retention; (3) hypotonus; (4) localized tenderness; (5) limited mobility.

Certain diagnosis could be made from direct signs. Of the indirect signs, the spasmodic hour-glass was the most important, and was an almost certain sign of ulcer. Other secondary signs alone were sufficient to justify a diagnosis, but if correlated with clinical and laboratory evidence diagnosis might be made much more certain. Belladonna or atropine would differentiate between the intrinsic and extrinsic types of spasmodic hour-glass. The spasmodic type, when intrinsic in origin, was just as important from a diagnostic standpoint as the organic. Spasmodic hour-glass of extrinsic cause was not common, but might be due to a duodenal ulcer, gall-bladder disease, or appendicitis. When due to duodenal ulcer the spasm would not be relaxed by belladonna. Pseudo hour-glass stomach might be caused by contraction of the abdominal muscles, pressure of stomach against spine, adhesions, bands, atony, or gas in colon. Duodenal ulcer was more difficult to diagnose radiographically than gastric ulcer. The direct sign was deformity of duodenal contour. Indirect signs were alterations in gastric tone, in peristalsis, and in motility, gastro-spasm, localized tenderness over cap. The first three signs were an indication of duodenal irritation, and might be associated with conditions other than ulcer; they had often been found in association with mobile colon, with gall stones, and with appendicitis. Taken in conjunction with a typical clinical picture, these were strongly suggestive of duodenal ulcer. If hyperactivity of stomach were found in association with retention and an enlarged stomach of normal outline, the diagnosis was almost certain.

Mr. SETON PRINGLE was of opinion that in diagnosis of gastric ulcers, *x*-ray reports were of the greatest help. Duodenal ulcers were different, as their clinical history was much more definite and the diagnosis could be verified much more directly. His treatment for gastric ulcer was: if small—cautery excision, and gastro-enterostomy; if large and in body of stomach—knife excision, and gastro-enterostomy; if large and in pyloric portion—pylorectomy. He was of opinion that gastro-enterostomy alone could cure some cases of ulcer in cardia. His treatment for duodenal ulcer on the anterior wall was cautery and gastro-enterostomy. If difficult of access he closed the pylorus by using round ligament as ligature and made a gastro-enterostomy. In gastric ulcer cases, he mostly based his diagnosis on the effect of medical treatment, and in duodenal ulcer on nocturnal pain. Tenderness and haemorrhage were fallacious signs.

Dr. R. J. ROWLETTE said that in practice it was often necessary to make a diagnosis of gastric ulcer without an *x* ray report or an operation. Unless the art of diagnosis was bankrupt, they must make practical diagnosis of cases which fell short of absolutely demonstrated certainty, and it was, he thought, of cases like this that physicians had most experience. Regarding diagnosis, he had obtained a good deal of help from *x*-ray reports, and he would be very sorry to be deprived of the help of the radiologists. Very often cases which had no haemorrhage and no perforation got well by medical treatment, the chief part of which, in his opinion, was rest. Recurrence might take place, but that was liable to happen after operation also. He would be interested to know if many cases of gastric haemorrhage had proved fatal, as he thought that must be an extremely rare occurrence.

Mr. MCCONNELL said it did not seem possible that an ulcer could be diagnosed on the clinical symptoms alone. He had seen several patients who had been operated on for duodenal ulcer, and at the operation no ulcer was found, but there was always something wrong with the duodenum; these were examples of duodenum irritation. *X*-ray reports had been of the greatest benefit to him in dealing with these cases.

Dr. HAYES remarked that *x*-ray examination was only one method of establishing diagnosis, and the radiographic report should not be regarded as conclusive evidence. There should be more intimate co-operation between the physician or surgeon in charge of the patient and the radiologist. It was unfair that a diagnosis should be made on the radiologist's written report without a consultation between the doctor in charge and the radiologist.

Mr. STONEY thought it important to do a gastro-enterostomy at the time when operating for perforated duodenal ulcer. He had formerly thought that gastro-enterostomy added considerably to the danger of the operation, but experience did not confirm this view, and when gastro-enterostomy was performed the recovery was quicker and more complete than when it was not done. After gastro-enterostomy the return to feeding should be very gradual. Dr. W. M. CROFTON did not think that *x*-ray reports were any aid to diagnosis in early cases of ulcer.

TECHNIQUE OF CAESAREAN SECTION.

A MEETING of the Section of Obstetrics and Gynaecology of the Royal Society of Medicine was held on February 1st, with the President, Dr. T. WATTS EDEN, in the chair, when Dr. S. J. CAMERON read a paper on the technique of Caesarean section.

Dr. Cameron said that his object was to relate briefly the technique which had enabled him to perform 107 successive cases of Caesarean section in rachitic subjects with only one death. It was a decided advantage to have patients under observation for some days before the operation, in order that minor ailments might be treated; for example, special attention should be paid to "colds," as rachitic patients were very susceptible to pulmonary complications after operation. Chloroform was preferable to ether as an anaesthetic. The fatal case in his series died from bronchopneumonia. Perhaps the most important danger to be considered was sepsis. He now performed craniotomy in most patients who had been repeatedly subjected to vaginal examination before admission to hospital, and in all cases where the membranes had been ruptured for longer than twelve hours. The abdominal incision was best made through the right rectus sheath. As regards cases of repeated Caesarean section, where there were numerous and dense adhesions in the region of the former scar or scars, Dr. Cameron thought it advisable not to divide these adhesions, but to avoid them by evacuating the uterine contents by transverse incision in the abdominal and uterine walls. He paid great attention to packing the uterus off from the peritoneal cavity before he opened it. He used two knives—one for opening the abdomen, the other for incising the uterus. He had given up mattress sutures for closing the uterus incision, and now used interrupted sutures of catgut reinforced by three interrupted sutures of silk. He thought the free use of silk within the abdomen was unjustifiable, as, if infected, it might lead to the formation of a sinus. He had seen two cases of uterine sinus or fistula resulting from infected silk sutures. He did not favour the lower uterine segment operation, though it certainly seemed to have diminished the liability to rupture of the scar on a subsequent occasion. It was a difficult operation, and it should be remembered that maternity homes, staffed by general practitioners, were being opened in all parts of the country. Before the patient left the operating-table the surgeon should compress the uterus through the abdominal wall, and if a trickle of blood failed to appear the probability was that a retained portion of membrane was occluding the os; in such a case the index finger should be introduced into the sterilized vagina and forced up the cervical canal.

Mr. BECKWITH WHITEHOUSE and Dr. HENRY FEATHERSTONE read a note on two cases of Caesarean section under spinal anaesthesia with tropacocaine. The first case was one of pregnancy complicated by chronic nephritis and diabetes; the second was one of *ante-partum* haemorrhage. In both cases the anaesthesia was in every way satisfactory and the result to mother and child extremely good. Three points were worthy of notice: (1) The infant cried lustily as soon as extracted, and presented a very different appearance from that often seen when inhalation narcosis was employed. (2) The tone of the uterus; as soon as the child was extracted the uterus contracted firmly and partly expelled the placenta through the uterine incision. (3) The operation was practically bloodless, due to the tone of the uterus.

Mr. MILES PHILLIPS thought that Dr. Cameron's wonderfully low mortality rate was chiefly due to the wise rules for the selection of cases suitable for Caesarean section.

Dr. J. D. BARRIS thought spinal anaesthesia a good method

in certain conditions such as morbus cordis, diabetes, or pulmonary complications; but the use of morphine was excluded for the sake of the child, and he therefore preferred, in routine cases, to perform the operation under a general anaesthetic.

Dr. HERBERT SPENCER said that Professor Barr had published a series of 97 selected cases without a death—a better series even than Dr. Cameron's. But he thought that both these obstetricians made such a selection of cases as must lead to the unnecessary sacrifice of many children's lives. He saw no reason for refusing to perform Caesarean section when the patient had been examined and the membranes ruptured for twelve hours; so far he had only lost one case of Caesarean section for contracted pelvis, a case already infected at the time of operation, which should have been dealt with by total abdominal hysterectomy, an alternative to craniotomy not mentioned by Dr. Cameron.

Clinical Cases and Specimens.

Dr. J. S. FAIRBAIRN showed specimens: (1) A necrotic fibromyoma in a patient of 74 simulating cancer of the body of the uterus. The patient gave a history of slight uterine haemorrhage with offensive discharge for two months. The cervix was atrophic, but the uterus was somewhat enlarged. The cervix was dilated and the uterine cavity explored, and portions of necrotic material came away as the dilators were withdrawn and appeared sufficiently certain evidence of malignancy. The uterus was therefore removed by abdominal hysterectomy. Examination of the specimen showed it to be an innocent polypoid growth made up of cystic spaces lined with endometrial glandular tissue, and it could have been removed quite easily after dilatation of the cervix. (2) A cyst of the uterine cornu due to dilatation of the interstitial portion of the tube. The patient was operated on for an inflamed ovarian cyst, and both Fallopian tubes were found distended with blood-stained fluid. There was also a cystic swelling in the right cornu of the uterus; the body of the uterus was removed, as the nature of the cyst was uncertain. The cyst was found to be lined by tubal mucous membrane and had evidently arisen by blocking of the lumen by inflammation.

Mr. BECKWITH WHITEHOUSE described a case of adenomatosis vaginae. The patient was a multipara aged 40, who had had constant muco-purulent vaginal discharge dating from a forceps delivery five years ago. Examination showed a very unusual condition of the vaginal vault; the cervix was lacerated and everted, and was the seat of numerous small cysts of the typical Nabothian type which had extended widely to the upper half of the vagina, so that the vaginal vault was completely studded with small cysts, varying in size from a pin's head to a pea. The cervix was amputated, several of the cysts were excised and the remainder obliterated by means of the cautery. The patient was now reported to be free from discharge.

Drs. WHITE-COOPER and H. K. GRIFFITH communicated a case of inversion of the uterus occurring in the third week of the puerperium. There was pronounced inertia of the uterus during labour, which was terminated by forceps and with the help of pituitary extract. There was severe *post-partum* haemorrhage in the third stage of labour. On the fourteenth day of the puerperium the patient sneezed several times, and this was followed by bright haemorrhage from the vagina; at the same time the temperature rose, and during the next two days the patient had rigors. On examination the uterus was found to be inverted. Under an anaesthetic the uterus was reinverted, but the fundus slipped back quickly through the cervix, so the uterus was again replaced and the cavity packed with gauze soaked in flavine. The gauze was slowly withdrawn, beginning twenty-four hours after the operation, and was completely removed at the end of the third day. The patient made a good recovery.

Drs. White-Cooper and Griffith also reported a case of obstructed labour due to a contraction ring. After the patient, a primigravida aged 32, had been in labour for three days, examination under anaesthesia showed a tight ring of contracted uterus in front of the shoulders, preventing them coming down and preventing also version being performed. Steady traction by forceps failed to move the foetus. It was then decided to perforate and crush the head, then do version and use the breech to dilate the ring; when the crushing was nearly completed the ring was felt to relax and the foetus was quickly extracted by version.

THE SURGERY OF ABDOMINAL TUBERCULOUS GLANDS.

A MEETING of the Liverpool Medical Institution was held on February 1st, with Professor E. E. GLYNN in the chair, when Mr. G. C. E. SIMPSON read a paper entitled "The surgical aspects of tuberculosis of the abdominal lymphatic glands."

Mr. Simpson said that the acute complications of this condition usually brought the case to the hands of the surgeon, instancing general and local tuberculous peritonitis following rupture of glands, abscess, acute obstruction by bands or adhesions, intussusception, rupture into the bowel, and erosion of the mesenteric artery. He next considered cases complicated by acute and chronic appendicitis, chronic obstruction with serious gastric sequelae and tuberculous infection of the bowel, and gave illustrative cases. He pointed out that enlarged glands might lead to strangulated hernia either by entering the hernia sac and mechanical obstruction, or by causing acute tuberculous peritonitis and leading to oedema and adhesion.

He then discussed the symptoms associated with tuberculosis of one or of a few groups of abdominal lymphatic glands apart from complications. He quoted one case of haematuria cured by removal of a large calcified gland (alluding to Thomson-Walker's work), and three cases of haematemesis among others with less striking symptoms, cured apparently by removal of calcified glands. He also referred to a case of chronic constipation apparently due to tuberculous glands along the vessels of the colon, cured by resection of glands and ascending colon *en masse*, and in another case by resection of the same with three feet of the terminal ileum. A number of cases were mentioned with recurrent abdominal pains where no causative lesion other than tuberculous glands were found, and which improved after resection. In one case of a solitary gland without abdominal symptoms, the gland was 1½ inches in diameter, very caseous and presenting under the peritoneum without any attempt at limiting adhesion. The complicated nature of the operation where many adhesions or a large abscess was present, the unsatisfactory outlook after short-circuiting even if combined with evacuation of the abscess, and the high frequency of serious complications led the speaker to plead for earlier surgical attack on the glands. In such cases the operation either of enucleation or of resection of glands and involved intestine was safe and only called for patience.

Mr. Simpson quoted 57 cases: about equal numbers showed acute complications, chronic complications, and no complications. Twelve cases were over 30 years of age, twelve under 10 years, twenty-one between 10 and 15 years, and twelve between 20 and 30 years. Removal of glands was done in 43 cases, and of these 15 showed no recurrence and three had not been traced; two cases showed signs of abdominal tuberculosis. In one case short circuit and scraping out of a large abscess was done in March, 1920, and the man was still at work, but had ascites. Three cases had phthisis; two had died. In fourteen cases in which removal was not attempted two died, two had phthisis, and eight were cured.

On these results he based the following conclusions: (1) Guided by the condition of the patient, operation for the relief of acute and chronic complications of tuberculous glands in the abdomen was not complete unless not only the gland directly involved but any other group infected was removed. In widespread cases where eradication was impossible, it might be advisable to remove glands over which the peritoneum was thinned. (2) Many chronic abdominal symptoms were directly due to tuberculous glands, and removal of these was indicated where other causes for the symptoms could not be found. (3) Even in the absence of symptoms tuberculous glands, and more especially caseous glands, should be removed whenever the condition of the patient allowed. This was a question of prophylaxis, and was as much indicated as the division of bands or of a normal appendix during laparotomy for other conditions.

Mr. W. H. THOMPSON commented on six of his cases in which abdominal tuberculosis had necessitated operation for acute intestinal obstruction. In one where perforation and massive destruction of intestine compelled him to do resection, the patient died. In four cases where involvement was so extensive and the condition of the children so poor his zeal was limited to combating the obstruction by short-circuiting the bowel. All these cases recovered and were apparently well. As such seriously ill cases had done so well he adopted the same treatment where the general condition

might have permitted a more radical operation; the result was equally satisfactory. Knowing how intolerant children were to intra-abdominal liberties he believed that in such severe cases the operation of necessity, usually lateral anastomosis, ought to be the operation of choice.

Ergotism.

Mr. R. E. KELLY and Dr. W. J. DILLING read a note on a case of ergotism with gangrene of the toes. Mr. Kelly said that it occurred in a patient aged 42, a Polish Jew, who had used rye bread for many years. Dr. Dilling tested the bread and flour from which it was made and found evidence of infection by the ergot of rye. Dr. Dilling detailed his pharmacological examinations. He discussed the life-history of *Claviceps purpurea* in cereals and grasses grown on damp, clayey soils during wet seasons. The chief symptoms of convulsive and gangrenous ergotism were mentioned, and the possibility of mild cases being diagnosed as gastro-enteritis was pointed out. Tabular statements showed the rapid loss of toxicity in ergot on keeping and the adulteration (1 to 10 per cent.) in various epidemics. Cases were quoted showing the difference in susceptibility of individuals even in the same family, and an instance of 0.2 gram ergot a day causing gangrene was given. In the present case the evidence in favour of regarding it as an instance of gangrenous ergotism was as follows: (1) The man ate exclusively rye bread, in which mycelial tissue was found microscopically, and extracts representing 46 grams and 88 grams of bread produced distinct cyanosis of a cock's comb; rye from the mill contained 0.1 per cent. sclerotia, and the rye grains were also partially infected; an extract of the ergot caused tonic contractions of an isolated virgin guinea-pig uterus. (2) The patient's two attacks occurred in succeeding Novembers, when the ergot of the previous harvests would still be toxic. (3) There was no haemorrhage on removing the toe. (4) The patient's age, the absence of general arterio-sclerosis, and of extension of the gangrene, were all in favour of this consideration. As no further instances could be traced the case had to be regarded as one of idiosyncrasy.

Professor BRIGGS quoted past clinical opinion against ergot; the pharmacologists were now in search of the best ergot. For many years he had pleaded for closer association in teaching schools between the pharmacological laboratory and the hospital; for example, lists of hospital cases and the drugs used were quite as important as the present familiar long lists of operations. He remarked that the joint report read that night on the pathological condition was not incontestable and stimulated similar efforts.

Myeloma of the Ischium.

Mr. G. P. NEWBOLT read a note on myeloma of the ischium treated by gouging and radium. Mr. Newbolt described a case of myeloma involving the tuber ischii and extending upwards towards the acetabulum and forwards along the ramus towards the pubes. The patient was a man, aged 47. X-ray photographs showed the extent of the disease. At the operation the growth was freely gouged out. A few days later a tube containing 105 mg. of radium was left in the main cavity for twenty-four hours, and in the cavity of the ramus for a second twenty-four hours. Four years had passed and the patient remained quite well. Dr. C. THURSTAN HOLLAND showed *x*-ray photographs which he had taken of the condition before and after operation, and he described the bone changes characteristic of the condition.

ARTIFICIAL LIMB FITTING.

At a meeting of the Aberdeen Medico-Chirurgical Society held on February 1st, with the President, Dr. ALEXANDER OGSTON, in the chair, an address on "The art of limb fitting: a plea for the standardization of amputations" was given by Dr. MIDDLETON CONNON, medical officer in charge of the Orthopaedic Annexe and Limbless Centre, Ministry of Pensions, Aberdeen. From the experience of five years at this centre, with the supervision of some 1,400 cases, Dr. Connon advocated practical reforms in the performance of amputations in civil surgery. Although the surgeon in civil cases had the selection of the site of amputation, there was too often a tendency to conform unnecessarily to the "classical" amputations; in such cases co-operation between the surgeon and the limb fitter was essential in dealing with the problems presented. War experience had shown that only certain amputations could be fitted with satisfaction to all concerned; other "classical" amputations which had proved impracticable as a limb-fitting proposition should, Dr. Connon maintained, be deleted from the textbooks and relegated to lectures on the history of surgery. He then reviewed the sites of amputations of the extremities most likely to be satisfactorily fitted, the reasons for their selection, and the stumps which had proved unsatisfactory. He also referred to the great importance of education in the use of an artificial limb, holding that the best method was to start the patient, as soon as the stump was ready, with the artificial limb which he was permanently to have, the limb not being finished off until all adjustments necessitated by the shrinkage of the stump had been made. He deprecated the use of temporary legs, plaster pylons, and so forth.

At the conclusion of the paper, various models of artificial limbs were shown by representatives of limb-making firms, and Dr. Connon showed patients who had been fitted with limbs and demonstrated very convincingly their ability to use them to full advantage. A short discussion followed, in which Professor MARNOCH, Mr. ALEXANDER DON, and the PRESIDENT took part. Dr. Connon's suggestions as to the teaching of "classical" amputations were generally supported. Dr. CONNON then replied, and on the motion of the PRESIDENT was awarded the thanks of the Society for his lecture and demonstration.

A MEETING of the Bath Clinical Society was held on February 2nd, with Mr. W. G. MUMFORD, the President, in the chair, when Dr. A. B. CLUCKIE read a paper on the differential diagnosis of acute conjunctivitis, acute iritis, and acute glaucoma. He discussed the differential features of these diseases both with regard to objective signs and subjective symptoms, and described the correct methods of measuring the ocular tension and the pitfalls of the wrong methods. Dr. A. B. Cluckie also showed a case of orbital tumour. Dr. R. G. GORDON showed a case of Charcot's hip-joint in a case which was probably haematomyelia; he also exhibited a case of rheumatoid arthritis with achlorhydria gastrica which showed in addition signs of early pernicious anaemia and early subacute combined degeneration. Dr. V. M. COATES showed a case of early rheumatoid arthritis with enlarged glands and achlorhydria gastrica, and discussed the importance of the latter sign. Mr. FORBES FRASER showed a specimen of round-celled sarcoma of the breast and a case of probable gumma of the breast; he exhibited also a specimen of a large gall stone which had given rise to very acute abdominal symptoms, and an *x*-ray photograph of a case with a very large gastric ulcer which gave rise to remarkably few symptoms. Dr. SPENCE showed a blood smear from a case of lead poisoning showing punctate basophilia. Dr. MITCHELL showed a specimen of a calcareous subpatellar bursa. Dr. F. G. THOMSON showed a specimen of a large round-celled sarcoma of the kidney. Dr. PRESTON KING showed an *x*-ray photograph of a fracture of the body of the fifth cervical vertebra which had developed tuberculous disease or a secondary growth. Mr. W. G. MUMFORD showed a case of severe double talipes, and also a case of old arthritis of the hip of seven years' duration in a child aged 10 showing signs of coxa vara.

THE Medico-Psychological Association of Great Britain and Ireland will meet at the City Mental Hospital, Gosforth, Newcastle-on-Tyne, on Thursday next, February 22nd. The chair will be taken by the President, Professor G. M. Robertson of Edinburgh, at 2.45 p.m. Discussions will be held on the future policy of the Association as regards its nursing certificates and examinations, and also on the appeal for funds for the prevention and treatment of insanity, and the formation of the Council of Mental Hygiene.

THE annual report of the Institute for Medical Research of the Federated Malay States for 1921 has reached us recently. It is compiled by Dr. William Fletcher, acting director of the Government laboratories, and deals in the main with routine work; but a special inquiry was held into cases of malaria described as "quinine resistant." Of 44 such cases investigated, in only one was the condition uninfluenced by quinine; in one other case described as "relatively resistant" parasites persisted for a long time in spite of treatment. It is pointed out that before accepting a statement that a case resists quinine care should be taken to make certain that the drug is being swallowed by the patient.

Reviews.

THE SURGERY OF THE WAR.

[FIRST NOTICE.]

IN the two volumes which treat of the *Surgery of the War*[1] the editors and contributors have acquitted themselves nobly. To write the story of the surgical achievements which the years 1914–18 cover was a monumental task. One may truthfully say that the surgeon of to-day, once more engrossed in civilian practice, hospital or private, will have his memories vividly awakened by the perusal of these volumes. Clad in their unattractive green backs (why should an "official" book not seek to please the eye and tempt the buyer as much as those issued by private enterprise?) he may pass them by. But though the outside may be rather official most of the inside is thoroughly human and interesting. The print is clear, the paper heavy, and most of the illustrations are admirable, many having been reproduced most faithfully in colour.

It has been said by Bacon that "It is the nature of the mind of man, to the extreme prejudice of knowledge, to delight in the spacious liberty of generalities." It is certainly very natural for the reviewer of a book like this to cloak his remarks in generalities, and he trusts that he will be forgiven if he fails to mention many admirable sections and descriptions.

The first volume begins with a section on projectiles, their varieties, velocities, theories of action, relative sterility and effects on the various tissues. This section, whilst of general interest, will appeal especially to the professional soldier, both combatant and medical.

The destructive effects of shell and bomb bursts in confined spaces are described, and the mechanism by which death follows from explosion without wounding is discussed, but a definite conclusion is not reached. A long paragraph by the editors on the radiating effects of missiles is very much to the point; concrete examples are given of severe injury to underlying soft parts from wounds caused by missiles which struck glancing blows without penetrating deeply themselves. There are two photographs of a slip of German dum-dum bullets. It is doubtful how widely these were used. The explosive action of the standard pointed-nose bullet in the skull was well known long before this war, and in the limbs its pulverizing action on bone was so great that exit wounds at least were commonly of an explosive type. Certainly the soldier himself frequently asserted that he had been hit by an explosive bullet, sometimes adding that he had heard it burst! It was usually difficult to exclude the possibility that the sound that he heard might well have been the impact of the missile on bone. Burns from shell-bursts were not so important in the field as they were in naval warfare, and the great heat generated by large shells fortunately failed to reproduce the conditions described at sea by Surgeon Commander H. E. R. Stephens.

Wound Shock.

We turn next to the chapters on wound shock. Shock remains one of the *bêtes noires* of surgery, because the surgeon cannot properly explain it, and as a result cannot properly treat it. This statement needs, perhaps, a little qualification, and may seem ungenerous to those who have laboured so well to elucidate it. But it remains that our treatment is still largely empirical, though by no means entirely unsatisfactory. One thing the war brought home to all, and that was the effect of certain anaesthetics in increasing shock, and the value of one anaesthetic—gas and oxygen—in diminishing the chances of producing it. In the short chapter on anaesthesia these considerations are discussed. The apparent improvement under ether anaesthesia and the subsequent rapid collapse of badly shocked men was often a surprise, and spinal anaesthesia, from which we had reason to expect so much, caused too great a fall of blood pressure. Failing gas and oxygen, ether from the Shipway apparatus is cordially recommended. Marshall has pointed out that 54 per cent. of abdominal cases had bronchopneumonia with open ether, only 14.7 with warm ether. But it is evident that in abdominal operations, and especially those on the upper abdomen, there is always the question of lung collapse, from immobility and interference with expansile mechanism of the lower parts of the lung, to be reckoned with. This chapter, by Captain H. P. Crampton, should be read by all, though it might have been developed with advantage.

To return to the sections on shock and blood transfusion by Lieut.-Colonel Cowell, Captain Fraser, Major Gordon Taylor, and Captain K. M. Walker. It brings us at once to the admirable work which was carried out at the instigation of the Medical Research Council and fostered by it. This body deserves the very highest praise for the work it did, and in these volumes the reader will constantly see traces of its handiwork. Fraser's article on wound shock in casualty clearing stations forms the best synopsis on shock with which we are acquainted. "The problem of the lost blood" is entered into in considerable detail, stress being laid on the observations of Captain (Professor) Emrys-Roberts on the higher red cell count in the capillary as compared with the venous blood. The Crile-Mummery theory of a primary vasomotor paralysis is dismissed; similarly the excessive storage of blood in the splanchnic area receives no support. The evidence against a splanchnic storage rests on naked-eye observation at operation. But it might well be asked how much reliance can be placed on such a method. One of the outstanding features of shock is pallor of the skin, and yet we are to believe that a large concentration of blood takes place in the capillaries of the skin. If such be the case it occurs to one to suggest that superficial observation of the splanchnic vessels may be an inaccurate method of estimating the volume and concentration of the blood contained within them.

Chromatolysis of the nerve cells of the brain and cerebellum is put down to anaemia and relative deficiency of oxygenation owing to the low pressure. This is an extremely probable explanation and rests largely on the pathological investigations of Mott. Due attention is paid to the histamine shock of H. H. Dale. There is adequate acknowledgement to Henderson for his work on the genesis of acidosis in shock. Cowell's blood-pressure observations under varying conditions of excitement, fear, and pain furnish some most interesting passages. The tracings are of very exceptional interest, and the chapter gives a most lucid and suggestive description of the conditions likely to favour the onset of wound shock, and illustrates also the relation between primary and secondary shock, the influence of anaesthetics on these patients, and the effects of toxaemia. The development of severe shock in lightly wounded men is made clear, and no less so the aggravation of their condition by the rapid onset of microbic infection. In fact, a strong link is forged connecting gas infections with the lowered blood pressure and the sluggish circulation of shocked patients. The influence of injured vessels in inducing gas infection in the muscles of the anaemic territory is brought home by Sir Cuthbert Wallace in a very able chapter. Stress is laid on the importance of avoiding further vessel damage in the excision of the wound. This section is illustrated by some of A. K. Maxwell's beautiful coloured drawings.

There is a good deal of overlapping in the sections hereabouts which makes it impossible to give the various authors their due, for shock, haemorrhage, and infection naturally come within the range of all. Great stress is laid on warmth, sleep, and the giving of fluids (especially hot sweetened tea) in the treatment of primary wound shock. The question of morphine is handled with reservation, large doses being condemned. It is generally admitted that it is harmful in acidosis, and should therefore not be given to cyanosed patients. It is interesting to recall that Crile, who was at one time the high priest of morphine for shock, in his latest writings has somewhat modified his use of the drug. Bayliss's 6 per cent. gum acacia in 0.9 per cent. saline receives more general commendation than we should have expected, as the blood transfusion enthusiasts at one time rather condemned it—not as harmful, but as of little value. This was, no doubt, an exaggerated view, and there can be no doubt about the inefficiency of ordinary normal saline which was the panacea for everything fifteen years ago. How many dying patients had their last hours disturbed by the zeal of the house-surgeon and his miraculous saline! Of drugs, camphor and digitalin receive highest commendation, pituitary having a more temporary action. Strychnine, of course, is not recommended.

[1] *History of the Great War, Based on Official Documents: Medical Services. Surgery of the War.* Vols. i and ii. Edited by Major-General Sir W. G. Macpherson, K.C.M.G., C.B., LL.D., Major-General Sir A. A. Bowlby, K.C.B., K.C.M.G., K.C.V.O., Major-General Sir Cuthbert Wallace, K.C.M.G., C.B., and Colonel Sir Crisp English, K.C.M.G. London: H.M. Stationery Office. 1922. (Med. 8vo, pp. vii + 618 and 604 respectively; illustrated. 25s. each net, post free 26s.)

Tetanus and Trench Foot.

Tetanus is dealt with by Sir F. W. Andrewes, and the tables and charts which he uses illustrate the fall in mortality which followed the prophylactic injections. Sir David Bruce's work is freely mentioned. A few cases of local recurrent and late tetanus, always subjects of exceptional interest, are referred to.

The section on trench foot is rather short, but the reader is referred for further information on this fruitful cause of "wastage" to the volume which is to be published on the hygiene of the war.

Field Ambulances and Casualty Clearing Stations.

The account of work in the field ambulances and the development and rise of the casualty clearing stations will interest many readers, bringing back recollections of friendships, of work on teams, and of the gradual evolvement of the high efficiency which came to mark these units. The amount of work the clearing stations got through was often astonishing: for instance, 30,000 operations were done during the first four and a half months of the Somme fighting; 14,400 men were admitted to thirteen casualty clearing stations of the Fourth Army on the first day, 13,806 on the second, and 8,793 on the third. The total number of wounded on the Somme from July 1st to November 17th, 1916, is stated to have been 318,408. At the battle of Messines, 10,434 wounded were treated in eleven casualty clearing stations on the first day. The effects of early operation were immediately evident, for of these only 0.5 per cent. developed gas gangrene subsequently, and the base hospitals reported a low death rate and few amputations.

The casualty clearing station was an innovation, and no doubt has come to stay, though it is interesting to speculate what shape it might take in a more mobile war than the last. At all events we trust that the lessons learned in this war, and particularly the importance of mechanical as opposed to chemical cleansing, will not be forgotten. Operations must be done early, and every facility for the carrying out of the necessary treatment must be provided as close as possible to the firing line. In future wars, unless an international arrangement is held to, advanced operating stations may be driven underground by aircraft.

Wound Treatment.

The important subject of wound treatment is discussed by more than one writer, and considerable overlap occurs. There is no doubt that the South African war did our army surgery a great disservice; for it was easy to attribute the relative benignancy of long-range bullet wounds in that campaign to the success of the full use of antisepsis and asepsis. How far this was from the truth we were soon to learn.

Sir George Makins, in his chapter on "Surgery in general hospitals," has a well written review of the various steps in our re-education. Everyone will recall the failure of the antiseptics and will remember Sir Almroth Wright's crusade against chemicals. His ingenious experiments and the attractive physiological character of his explanations gained many adherents. Still, at the bottom of his heart, every surgeon loves an antiseptic, and though you may prove to him that in the case of wounds his chemicals do very little good, he is apt to hug them as being better than nothing. The fact that Sir Almroth Wright had reason on his side was abundantly proved by the improvement which followed the immediate excision of wounds, although Wright's own methods did not find wide favour. The excision method had been in use in this country, here and there, for some years before the war, but it must be admitted that the civilian surgeons who now say they always used it failed to make their voices heard at the proper time. In spite of arguments, antiseptics were used to the end in conjunction with excision, which was always given first place. We wonder how many hospitals are carrying out the principles of complete mechanical cleansing and of excision in their casualty cases to-day, or how many of the smaller hospitals realize how much they can save themselves in the cost of dressings, maintenance, and attendance by insisting on the primary excision of accidental wounds—to say nothing of the economic advantage from the patient's point of view.

Of the various antiseptics of the war those that appear to be surviving best are bipp, flavine, eusol, and the Carrel-Dakin method. Of bipp it may be said that its chief enemies are those who know least how to use it. Of the Carrel-Dakin method it may truly be asserted that though one may know well how to use it the difficulties of correct application are so great that few who have the knowledge can make good use of it. Of all antiseptic methods it is theoretically the most perfect, but it is certainly the most difficult and the most tedious. It is doubtful whether its disadvantages do not debar it from use on a large scale, and as it needs highly skilled attention it is not a method which can be used on the occasional case, for continued practice with it is necessary. The reader will find all that he wants to know about the various antiseptics in Sir Anthony Bowlby's article on the casualty clearing stations, in the article of Makins's already referred to, and in C. J. Bond's excellent paper on the hospitals in England.

Wounds of the Chest.

Wounds of the chest are dealt with by T. R. Elliott and G. E. Gask. A tremendous impetus has been given to the surgery of the chest as the results of war experience, and it is something of a relief to find that a very reasonable and conservative view is taken by the authors. No attempt is made to hide the serious nature of these wounds, or the very high mortality that attends them. Most surgeons who were in France in 1918 will remember the very optimistic view that was held by many of the newer surgeons. A few of these allowed their enthusiasm to outrun their discretion, and Gask speaks wisely of the training that is necessary before a man can become a competent chest surgeon. It was an interesting, nay a fascinating, discovery that the chest could be opened without the use of elaborate pressure chambers. True, this was no new knowledge, but it was knowledge shared by the few. It is a thankless task to discover who exactly was responsible for the change that came over surgical practice in regard to thoracic wounds in France. The names of three people will come to mind at once. But whoever he was, a great service was done to the armies. As in the case of the brain, it is impossible to give any accurate data as to the exact mortality of chest wounds on the field. The best results, excluding these immediate deaths, gave a mortality of about 27.5 per cent., or a little less than 1 in 3. Gradually the general principles which were applied to all wounds came to be applied to the chest—to operate early to stop bleeding, to excise the wound and broken bone, to remove lodged foreign bodies. But when applied indiscriminately to all chest wounds, the results were found to be very little if any better than had been obtained by the old conservative treatment.

The great problem in the chest as elsewhere was to combat sepsis, and though the above methods seemed eminently suitable to prevent this dreaded enemy from obtaining his foothold unnecessary operations were being performed with the best intentions, but not always with the happiest results. The turn came when it was laid down that blood effusions without evidence of serious intrathoracic injury were to be treated on conservative lines. An excellent account is given by Elliott of the physical signs in these cases and of the need for repeated needlings if infection of the blood is suspected. The clinical aspects of the cases are clearly described. Elliott discusses lung collapse in the injured and uninjured side. He is not a believer apparently in the frequent contralateral collapses which some claim to find. No cases of "pleural shock" are referred to. We should have liked to see a dogmatic statement on this point. A short description is given of surgical emphysema. It would have been worth while to have mentioned the very wide distribution of subcutaneous air sometimes found—at the wrists, for instance, on the scalp, and in the scrotum.

Gask's account of the operations of military surgery on the chest wall and lung is clear and well illustrated. The various stages of the operations are well figured. His insistence on aspiration of the chest on the day following operation is good. The various methods of dealing with pleural infection are described. Empyema is undoubtedly a more serious condition than has been generally recognized. It will be remembered that the exceedingly high mortality of post-influenzal empyema in the United States of America caused the appointment of an Empyema Commission of Enquiry. There is a good deal of truth in Gask's remark that the surgeons who took the most pains with their infected chests got the best results. This probably accounts for the excellent effects of the Carrel-Dakin method in Tuffier's hands, for this method insists on the surgeon's constant attention whether he wills or no. For persistent pleural fistulae the authors recommend decortication, but they do not describe how this is to be applied to those most difficult and persistent cases of all—those with long, shallow cavities running up

beneath the scapula to the third rib or thereabouts. They mention that in 1920 there were still pensioners suffering from persistent pleural sinuses. We might add that in 1923 they are still with us, though not perhaps all the same patients. These cases present some of the most difficult problems of surgery. The freed lung will not now expand, and the general condition of the patients often makes them the worst possible operative risks.

Wounds of the Pericardium and Heart.

Sir George Makins treats of wounds of the pericardium and heart. This is largely a compilation from the War Office collection and from the literature. It is very ably put together, and reads well. The figures illustrate a variety of wounds, some amenable to surgery, but many not within the possibilities of repair. A point is made of pericardial (and also of myocardial) sepsis, and one wonders whether some apparently brilliantly successful operations would have ended in the death of the patients had a drain been inserted. Major Litler Jones's dramatic case is described in full; here the pericardium was left open. In Sampson's it was closed with success—probably not a good precedent. The reader will find a workmanlike account of the various methods of exposure of the heart and some useful indications for operations.

A TEXTBOOK OF MEDICINE.

THE *Textbook of the Practice of Medicine*,[2] by various authors, edited by Dr. FREDERICK W. PRICE, will be of great service to the English medical profession. Usually English textbooks of medicine, for students and practitioners, have been written by one author. But since no physician can now claim an extensive knowledge of all of the groups of diseases described in a medical textbook, it follows that generally all sections of such a work, by one author, are not of equal merit. In this volume each section has been allotted "to one author, or to two writing in collaboration, instead of enlisting the services of a large number of writers." Altogether there are twenty-six contributors to the work.

The book commences with articles on fever by Professor Pembrey, and on infection, immunity, and immune therapy by Dr. J. Matthews and Sir Thomas Horder. Most of the fevers commonly met with in England are described by Dr. C. R. Box; the articles on septicaemia, erysipelas, influenza, tuberculosis, cerebro-spinal fever, and rheumatic fever are by Sir T. Horder; those on tetanus, anthrax, glanders, actinomycosis, and hydrophobia by Sir T. Horder and Dr. J. Matthews; and those on spirochaetosis ictero-haemorrhagica and epidemic jaundice by Sir W. H. Willcox. Trench fever is described by Lieut.-Colonel Byam, leprosy by Dr. C. R. Box, and acute anterior poliomyelitis and lethargic encephalitis by Drs. J. Collier and W. J. Adie. The article on syphilis is by Colonel L. W. Harrison. Tropical fevers and tropical diseases generally (in all sections of the book) are described by Dr. G. C. Low, and are treated more thoroughly than in any other English textbook of general medicine we recall.

This first portion of the book is of great value and interest, since it contains, in a concise form, the experience of writers who have devoted special attention to the diseases they describe. Dr. J. Collier contributes the articles on caisson disease, anoxaemia, and sea-sickness, and Sir W. H. Willcox those on heat-stroke, alcoholism, poisoning by arsenic, lead, mercury, and food poisoning. Dr. J. Matthews describes the bacteriology of food poisoning. A concise account of gout, obesity, and diabetes is given by Dr. G. Graham, who apparently recognizes the limitations of the starvation treatment in diabetes.

Rickets and scurvy, and also epidemic diarrhoea in children, are described by Dr. R. Hutchison. The relation of the sympathetic nervous system to endocrine glands is considered by Dr. Langdon Brown, and diseases of the suprarenal thymus, thyroid, and pituitary glands are described by Dr. O. Leyton.

The articles on diseases of the digestive system, liver, gall bladder, pancreas, and peritoneum are (with five exceptions) by Dr. A. F. Hurst, who gives us a concise summary of his own experiences, and of his valuable work on *x*-ray examination in these affections. Acute intestinal obstruction, appendicitis, and peritonitis are described by Mr. E. G. Slesinger. The accounts of diseases of the lymphatic system, blood, and spleen are by Dr. Hugh Thursfield.

The interesting section on diseases of the heart is written by Dr. F. W. Price (with the exception of one article). It shows the great advance in cardiology made in recent years, and is illustrated by eighty-six tracings and electro-cardiograms. Progress in the treatment of cardiac diseases is less evident. Sir T. Horder contributes a valuable article on infective endocarditis. The articles on disease of the arteries and veins, on thrombosis, embolism, and aneurysm are by Dr. T. Thompson; the relation of aneurysm to syphilis is emphasized. Angio-neuroses are described by Dr. W. Langdon Brown and Dr. Geoffrey Evans. The sections devoted to diseases of the air passages, lungs, pleurae, and mediastinum are by Drs. R. A. Young and G. E. Beaumont. The summary of the recent work on the causation of lobar pneumonia is of great interest. The affection is regarded as an acute infectious disease, and the authors advise that "if possible, no case of pneumonia should be nursed in a general ward of a hospital, and the doctor and nurse in attendance should wear gauze masks." Concise accounts of the various diseases of the nose, larynx, and pharynx are given by Mr. H. S. Barwell. This summary will be very useful in general practice.

Diseases of the kidneys are described by Drs. W. Langdon Brown and G. Evans. We are glad to note that in addition to the various forms of nephritis causing albuminuria, another group of cases is recognized—"leaky kidney." The name is not quite satisfactory, since it does not indicate what is leaking, but the authors have done good service by drawing attention to these cases, which are not infrequent in practice. "Leaky kidney" is defined as a "condition in which the kidney leaks, allowing some of the blood proteins to escape; but is not the subject of a progressive lesion as in nephritis." It is the result of some old damage, and may follow acute nephritis. Diseases of the joints and bones are considered by Sir William H. Willcox. A concise account of the various diseases of the skin is contributed by Dr. A. M. H. Gray.

The section devoted to diseases of the nervous system by Drs. J. Collier and W. J. Adie is very thorough. The account of brain tumours is of special interest; but some surgeons will not agree with the recommendation that "No attempt must be made to remove a tuberculoma . . . since any disturbance of its seat results invariably in tuberculous meningitis and death." The account of compression of the cord is excellent, and the great diagnostic value of lumbar puncture in these cases is emphasized. Myelitis is briefly mentioned under myelomalacia; it is often discussed in differential diagnosis; and syphilitic myelitis is described under syphilis of the nervous system; but no separate account is given of acute myelitis, in the transverse or disseminated form. Apparently acute myelitis is regarded as "nearly always of syphilitic origin." The work concludes with a concise section on psychological medicine by Sir Maurice Craig and Dr. E. D. Macnamara.

The book may be strongly recommended to students, general practitioners, and physicians. It is an excellent work, and gives, in a most concise form, a vast amount of valuable information, and the experience of many of the most able London physicians. The system of conjoint authorship has, on the whole, been well managed. In a book containing so great a mass of details it would be easy to pick out statements from which dissent might be expressed; but this would take us too far. The wording of the book is necessarily often very concise, and occasionally this obscures the meaning. The type is small and the paper very thin. In another edition the publishers might consider the advisability of improvements in these respects and might also with advantage encourage the authors to increase the number of illustrations.

CYTOLYSIS.

PROFESSOR G. H. ROGER, Dean of the Paris Medical Faculty, in a preface to a book by Dr. LOUIS BORY on the destruction of cells,[3] recommends it as a guide to laboratory workers on account of the concise information it contains, and to medical men for the practical applications that may be obtained from a study of autolysis.

The first part of the work deals with autolysis—the last act of life—under the two main headings of experimental autolysis *in vitro* and autolysis in the living organism; the

[2] *A Textbook of the Practice of Medicine.* By various authors. Edited by Frederick W. Price, M.D., F.R.S.Edin. Oxford Medical Publications. London: H. Frowde, and Hodder and Stoughton. 1922. (Demy 8vo, pp. xxxii + 1753; 95 figures. 35s. net.)

[3] *Les Phénomènes de Destruction Cellulaire.* By Louis Bory. Preface by Professor G. H. Roger. Paris: Masson et Cie. 1922. (Roy. 8vo, pp. iv + 212. Fr. 12.)

latter is divided into physiological autolysis, which is constantly taking place but is so compensated that no histological change or functional disturbance occurs, and pathological autolysis—for example, maceration of the dead foetus *in utero*, cerebral softening, the changes in the centre of tumours, and the effects of radiation on organs, such as the sexual glands, and on new growths. From comparatively recent work by Roger and by himself in conjunction with Garnier the author is inclined to doubt the view of previous investigators that the products of autolysis are highly toxic, and to consider that autolysis rather diminishes the injurious effect of the juices of the organs by lessening their coagulative power. Experimentally, autolysates from half its renal or hepatic substance are required to kill the animal, and as this amount of autolysis rarely occurs clinically it appears improbable that fatal results of this kind often occur in man. On the other hand, the autolysates may damage tissue of the same kind as that from which they are derived; thus slow destruction of one kidney entails the production of cytolysins which may seriously affect the other (sound) organ.

The second and much the larger part of this monograph deals with cytolysis under the headings of bacteriolysis, haemolysis, and organolysis. In the section on bacteriolysis anaphylaxis is described as resulting when the toxins liberated by destruction of micro-organisms are not properly neutralized, and a brief account is given of d'Herelle's phenomenon, which that authority, as is well known, regards as due to an intrabacterial ultramicroscopic organism or bacteriophage. The subject of haemolysis, as being the most familiar example, at any rate, of experimental cell destruction, is considered at length, and full attention is given to the pathological aspects of the process—for example, in haemoglobinuria and in jaundice. The concluding chapter on organolysis contains a summary of what is known on this interesting subject, with a number of useful references.

MENTAL DEFICIENCY.

IT is not surprising that there should so soon be a demand for a new edition of Dr. A. F. TREDGOLD'S work on *Mental Deficiency*.[4] The book is excellent in every respect, and no one who is interested in its subject can afford to be without a copy for study and reference. It is a most comprehensive textbook, and as it is generally accepted as a standard work and has already abundantly proved its worth its contents do not call for extended comment. The present edition has been thoroughly revised. The chapters dealing with moral deficiency, criminal aments, clinical examination, mental tests, and diagnosis have been entirely rewritten; considerable additions have been made to the chapters on psychology, mentally deficient children, and the clinical varieties of primary and secondary amentia; and a number of new illustrations have been added.

The presence of the defective in the community constitutes a serious social problem, and Dr. Tredgold deals with this aspect of his subject in the last chapter of his book. No recent statistics are available showing the number of aments still in need of care and control. The Report of the Royal Commission, 1904, estimated that the total number of persons urgently in need of provision was 66,509, and while the Mental Deficiency Act, 1913, has done something to alleviate the position, institutional facilities are still far from adequate to meet the need. Dr. Tredgold points out that the economic disability, the antisocial propensities, and the rate of propagation of these persons, combine to constitute a problem of a magnitude that no civilized country can afford to neglect, either in the interests of the defectives themselves or in those of the community. The author does not deal exhaustively with the question of prevention, but the few pages he devotes to this all-important problem merit the attention of all who are interested in the welfare of the race. His views on sterilization, segregation, and the regulation of marriage are marked by the common sense, balance, and restraint which characterize all his work. Similar comments are applicable to Dr. Tredgold's lucid treatment of moral imbecility, a subject which he has made peculiarly his own. We can again recommend this valuable book with complete confidence.

[4] *Mental Deficiency (Amentia).* By A. F. Tredgold, M.D., M.R.C.P., F.R.S.Edin. Fourth edition. London: Baillière, Tindall, and Cox. 1922. (Demy 8vo, pp. xx + 570; 31 plates. 21s net.)

ARAB MEDICINE AND SURGERY.

MR. M. W. HILTON-SIMPSON has published an elaborate and careful study of *Arab Medicine and Surgery*,[5] embodying a kind of native pharmacopoeia; it is founded on his experiences and observations amongst the usually reticent Berber and Arab doctors of the Aures Massif in Algeria. These mountains are on the fringe of the great Sahara, to the north-east of Biskra, and the district was selected by the author in 1912 as one in which he "might reasonably hope to find among its Shawiya Berber inhabitants relics of the past in the shape of arts, crafts, and customs which have long disappeared from the more accessible regions of Barbary before the advance of the successive waves of conquest which have swept over North Africa since the dawn of history." He was fortunate enough to become the friend of many native practitioners, who completely admitted him into their confidence, and thus, though himself a layman, he has been able to collect and arrange an extraordinary amount of information concerning native methods of medical and surgical treatment, methods which are destined soon to disappear with the advent of modern European ideas, in which the natives are beginning to have faith. It is the fatalistic attitude of the natives which has kept Shawiya methods so long alive, even in areas which can be easily reached by skilled European doctors. "Success is due, under God's will, to the skill of the doctor, failure and death to the will of God alone." This point of view is agreeable to the native doctor and also readily acceptable to his fanatical patients, who, moreover, have a dread of amputation, "with its unpleasant consequences in the next world."

The native practitioners in the Aures, with whom the author came in contact, were all men who had definitely studied medicine and surgery. They had been apprenticed to an established doctor, almost invariably a member of their own family, and were all comfortably situated from the financial point of view. Professor Edmond Doutté's assertion that "la médecine ne se distingue pas encore de la magie" may be correct in regard to the neighbourhood of Marrakash in Morocco, but cannot be extended to the Shawiya of the Aures. Belief in magic can, however, be traced in some of the native medical methods. Nearly all the practitioners possess "books, some in manuscript which have been handed down from their fathers, others modern reprints of Arabic authors obtainable in Constantine, Algiers, or, especially, in Tunis." These books are used to some extent as works of reference, though they may be of little value in ordinary practice. The works of three of the authors—Suyuti, El Haj Tlemsani, and Mohammed ben el Haj el Kebir—are apparently concerned as much with magical practices as with medicine. The works of Abderrezzaq, "the Algerian" (eighteenth century), are perhaps those best known to the modern native practitioners. It seems that the medicine as practised nowadays in the Aures is derived from that of the mediaeval Arabians.

One of the most important surgical operations performed is trepanning. "The native surgeons . . . are unanimous in declaring that injuries resulting from a blow are the sole cause of their favourite operation, which, they assert, is never resorted to for the relief of a malady not so caused, and is not performed as a magical cure in cases of persons supposed to be possessed by demons."

An extensive materia medica is alluded to in the book, and the author has taken great trouble to identify the plants used by native doctors. The work ought to interest many besides those specially concerned with the history of medicine.

NOTES ON BOOKS.

Tuberculosis in Infancy and Childhood,[6] by Drs. J. C. GITTINGS, F. C. KNOWLES, and A. P. C. ASHHURST, is based on a series of lectures delivered at the Children's Hospital, Philadelphia. The lectures were addressed to general practitioners; they deal mainly with the diagnosis and treatment of tuberculosis in early life, and attempt, by special sections devoted to the skin and to surgical affections, to comprehend all the more common sites of the disease. There is a good

[5] *Arab Medicine and Surgery: A Study of the Healing Art in Algeria.* By M. W. Hilton-Simpson, B.Sc. London: Humphrey Milford, Oxford University Press. 1922. (Demy 8vo, pp. viii + 96; 8 plates, 12 figures. 10s. 6d. net.)

[6] *Tuberculosis in Infancy and Childhood.* By J. Claxton Gittings, M.D., Frank Crozer Knowles, M.D., and Astley P. C. Ashhurst, M.D. Philadelphia and London: J. B. Lippincott Company. 1922. (Med. 8vo, pp. iv + 475; 23 figures. 21s. net.)

introduction on general considerations, with a useful historical summary taken from the literature. Unfortunately, however, this part is somewhat marred by the frequent sacrifice of clarity to conciseness, and by the failure to give references to the papers which are epitomized. In the chapter on diagnosis the danger of judging by the nutritional appearance of the child is pointed out; in the early stages there is little or no perceptible change, as is shown by the figures of Sachs, who found the nutritional state to be normal or above normal in 64 per cent. of a given series of children examined. On the other hand considerable importance is attached to a careful study of the temperature—especially of the extent of its diurnal variations. A thorough account of the technique and of the interpretation of the tuberculin test in its various modifications is provided. The main systems of the body are then dealt with in a simple, straightforward manner, and the book concludes with a chapter on general treatment, in which particular attention is directed to the prophylaxis of infection. There is nothing new, practically nothing original, and nothing markedly controversial—nor, we imagine, is there intended to be. As a compact and easily readable manual for general use it ought to supply a need felt by those whose practice makes too extensive demands on their time to allow of careful study of the more voluminous textbooks.

L'Artériosclérose et son traitement[7] is the third of the five volumes, all now in a second edition, of Dr. ARTHUR LECLERCQ'S *Les maladies de la cinquantaine*, and sets forth a rather startling conception of the relation of gout, obesity, diabetes, and arterio-sclerosis. It is that as a result of dietetic excesses, especially in protein food, the liver rises to the occasion and becomes abnormally active for a time—the stage of hyperfunction; this is succeeded by a phase of disordered function, which passes on into functional impairment and insufficiency. The result is that at about the age of 40 years gout is prone to appear, followed ten years later by obesity, then by diabetes, and lastly by arterio-sclerosis. The author regards gout, obesity, and diabetes, not in the light of ordinary diseases, but rather as protective measures adopted by the organism to prevent the flooding of the blood with poisons which would otherwise cause arterio-sclerosis. When the stage of hypofunction has developed the liver and kidneys are described as undergoing visceral sclerosis, though the liver, from the paucity of interstitial tissue, shows much less evidence of this change; at about the same time the arterial blood pressure rises, and this is followed by hypertrophy of the middle coat, a process analogous to the visceral hyperfunction; on this supervenes a widespread fibrosis of the arterial media. The author considers that this arterio-sclerosis is essentially distinct from chronic arteritis and atheroma, which affect the inner coat and are due to infections and intoxications of various kinds. These hypotheses, which do not appear convincing and are admittedly in opposition to the views commonly held, are developed in the first part of this volume; the second part is devoted to the treatment of arterio-sclerosis and its various complications and is on more conventional lines.

Professor T. B. JOHNSTON'S book on *Regional Anatomy*[8] is a contribution to the Students' Synopsis Series. It is intended for the student revising his anatomy in the dissecting room prior to examination. The author in his preface states that he is catering for the ordinary examinations only, and that consequently minor details and long accounts of unimportant structures are omitted. The more important facts and relations are emphasized by the use of italics. The old terminology is used throughout. The section on the central nervous system contains eleven diagrams. The descriptions of organs, structures, and relations are clear and concise, and in a review of a synopsis can more be said? This book should prove really useful to the student doing his final spurt.

Endocrine Glands and the Sympathetic System[9] is a translation by Dr. F. RAOUL MASON of the book by Lereboullet, Harvier, Carrion, and Guillaume which formed one of the thirty-two parts of the big treatise edited by Sergent, Ribadeau-Dumas, and Babonneix. This part was reviewed in our columns in March, 1921 (p. 463). A few footnotes have been added by the translator, with the collaboration of Dr. D. R. Ayres. The work of translation has been well done, and the general get-up of the volume is good—better, indeed, than that of the original.

[7] *L'Artériosclérose et son traitement. Les maladies de la cinquantaine*, Tome III. Par Dr. Arthur Leclercq. Deuxième édition. Paris: Librairie Octave Doin, Gaston Doin. 1923. (Demy 8vo. pp. 200. Fr. 12.)

[8] *Regional Anatomy*. By T. B. Johnston, M.B., Ch.B. Students' Synopsis Series. London: J. and A. Churchill. 1921. (Cr. 8vo, pp. 447; 11 figures. 12s. 6d. net.)

[9] *Endocrine Glands and the Sympathetic System*. By P. Lereboullet, P. Harvier, H. Carrion, A. G. Guillaume. Translated by F. Raoul Mason, M.D., with the collaboration of Daniel R. Ayres, A.B., M.D. Philadelphia and London: J. B. Lippincott Co. 1922. (Med. 8vo, pp. viii + 378; 31 figures. 25s. net.)

SEX AND SCHOOL COURSES.

CONSULTATIVE COMMITTEE'S REPORT.

"MEN and women have existed for centuries, but either sex is still a problem to the other—and indeed to itself; nor is there any third sex to discriminate dispassionately between the two." That is a sentence in the introductory chapter of a report prepared by a Consultative Committee appointed by the Board of Education to advise on the differentiation of the curriculum for boys and girls respectively in secondary schools, of which a preliminary notice appeared in our issue of January 20th. The report is one of the most interesting and illuminating documents upon an educational subject that we have read. Moreover, anything that touches the cultivation of the finer attributes and instincts of the sexes is of paramount importance; and school life is gradually extending its influence upon our children with a corresponding diminution of home influence.

The importance of the subject is only equalled by the difficulty attending the answer to the problem set to the Committee; and it has done well in this respect, if alone, for it has shown how many and how disturbing are the cross currents which need to be taken into account before any final determination can be arrived at. The difficulty of these cross currents is so great that in the one type of schools from which a conclusive answer might have been expected there is no answer. The protagonists of equality of the sexes who carry their belief to its logical conclusion have secured the establishment of not a few co educational schools both for day pupils and boarders; from these, if anywhere, one might have expected a clear account of the likenesses or differences of boys and girls in their work, their play, and in the reaction of the sexes upon each other in these respects. But in the appendix dealing with these schools no satisfactory answer is found. The co-education school system appears to have been mainly approved by the men witnesses, the head masters of the schools, for the chiefs of these schools are almost always men; criticism came largely from the women witnesses. The report does not indicate what particular cross current is responsible for this diversity of opinion, but it would seem that even here vested interest—the importance of the headship of a large mixed school as against the headship of a smaller department of a school—produces a very natural bias.

Evolution of the Secondary School Curriculum.

The report makes it clear that no satisfactory judgement on the present position of secondary education can be arrived at without a knowledge of the past history of education in this country. To meet this need a complete chapter has been devoted to the history of the curriculum in secondary schools. It appears from the preface that this is largely if not entirely the work of Mr. R. F. Young, and for this he justly receives the special thanks of the Committee. The account shows how great an influence opinion has had upon the work of schools. "The development of secondary education, more especially in girls' schools, has been influenced by successive currents of social opinion." In the early part of the nineteenth century the work of the public schools and grammar schools for boys was almost entirely literary—Latin and Greek grammar and versification. Attempts to expand the curriculum of the grammar schools was checked when Lord Eldon ruled in the Court of Chancery that it was illegal for the Governors of Leeds Grammar School to expend the endowment funds in teaching modern and commercial subjects. But the demand for such subjects caused them to be taught as extras, or "accomplishments," for which separate fees were charged. The Nonconformist academies established in considerable numbers from about the year 1662 provided a remarkably wide curriculum, even to the inclusion of natural science—chiefly physics. "These private schools had many faults and weaknesses, but they were more receptive to new ideas and more ready to experiment than the old foundations, and subsequent reforms in the curriculum can be traced largely to their influence." The movement spread to the endowed schools in the early part of the nineteenth century, with Butler at Shrewsbury, followed by Arnold of Rugby, Tait of the same school, and Thring of Uppingham. The foundation of a number of proprietary schools by bodies of shareholders gave an impetus to reform, and many of these newer

schools are now well known public schools. The influence of private enterprise was great; indeed, Sir Joshua Fitch reported in 1866 that in Yorkshire "almost all the educational enterprise of the last few years has originated with private teachers." The influence of the introduction of the examination system is also shown to have been at first advantageous in widening the curriculum. Simultaneously games and physical exercises were developed, school societies and other corporate out-of-school activities sprang into existence, so that "the boys' curriculum was already becoming rather heavy at the period (1860–1875) when it was adopted with some minor modifications as the model for courses in the new girls' schools."

Progress of Female Education.

In the girls' school up to this date the work was mainly devoted to "accomplishments." Sydney Smith, writing early in the last century, says: "The system of female education as it now stands aims only at embellishing a few years of life which are, in themselves, so full of grace and happiness that they hardly want it, and then leaves the rest a miserable prey to idle insignificance." And this was a costly performance, for fees at one of the fashionable girls' schools in Brighton were £500 a year! In general it may safely be said that the traditional education for girls up to about 1845 accentuated the differences between the sexes.

The movement for the better education of girls and women may be said to have begun in 1843 with the foundation of the Governesses' Benevolent Institution, which was designed to provide a system of examinations and certificates for governesses. This led to the establishment of Queen's College, Harley Street, and the leaders of the movement, such as the Rev. F. D. Maurice, took over the boys' curriculum which they knew, and handed it on to the women's college. Miss Beale and Miss Buss will always be regarded as the pioneers of the new girls' schools, and they were trained at Queen's College. These were no ordinary women, as the well known couplet of their pupils shows. Miss Buss, the sterner of the two, boldly threw out, so far as she could, "accomplishments," and made the curriculum of the North London Collegiate School, which she founded and brought to success, as nearly like that of the boys as possible. In evidence she gave in 1865 she said "she did not think that a girl's education should differ essentially from that of a boy in the same rank of life with regard to the subjects which were to be taught, though it was rather difficult to ascertain what was the proper education for a boy." Miss Beale followed much the same lines, with a leaning to milder measures, for she retained the old-world accomplishments in her school at Cheltenham, and recognized the importance of art, for she was a friend of Ruskin. Thus the theory of the emancipation of women seemed to work out on a theory of imitation. The main causes of the assimilation of the girls' curriculum to that of the boys are summarized under three main heads: Humanistic—on the belief that "nature has given to girls equal capacities with boys for acquiring the greater part of that knowledge which is comprised in our higher education." Vocational—on the ground that "every lady is or must be a teacher of some person or other, of children, sisters, or the poor." Economic—in the aim of fitting women to earn a living.

But the influence of parents was inevitable; accomplishments were not allowed to be banished; science, mainly botany, was added owing to the favouring influences of the Sciences and Arts Department, and later domestic subjects were introduced. So that the curriculum, already too full for the boys, became more than overfull for the girls.

Vicious consequences of three competing Government departments in education led, in 1899, to the formation of the Board of Education. The Board enunciated a policy which aimed to secure "a certain measure of breadth and richness in the curriculum of secondary schools, and to leave them a larger freedom in devising and executing schemes of education of their own." The task set to the Board's Consultative Committee is the natural consequence of this policy. It asks: "Should boys and girls study the same subjects in secondary schools? Should they study all subjects in the same way and up to the same standard? And if any different treatment is desirable, what should the difference be?"

At the outset the Committee found one difference: "It seemed to be implicitly assumed that girls' schools, in addition to giving their pupils a general education, should also give them some training designed to fit them for the duties of home life and of motherhood." There is a compulsory provision in girls' schools of practical instruction in domestic subjects (such as needlework, cookery, laundry work, housekeeping, and household hygiene) which are in practice generally substituted for the wood-work and metal-work taught in boys' schools. For girls over 15, domestic subjects may be substituted partially or wholly for science and for mathematics other than arithmetic.

It appears that the substitutions allowed for the domestic subjects does not relieve the strain on the girls. There was evidence that girls are much less able to protect themselves against overpressure than boys, who have, as a rule, a habit of "healthy idleness," whereas girls are more conscientious. As one witness expressed it, "If you give a girl too much to do she breaks down; if you give a boy too much to do he doesn't do it." It was further found that the curriculum both for boys and girls was modelled too much with regard to preparation for university and professional examination and failed to provide sufficient contact with practical life. Girls, being more receptive than boys, absorbed the knowledge without giving thought to it, so that on entering into work they were found not to have acquired the habit of thinking and acting for themselves and correlating such knowledge as they possess. The assiduity of the women mistresses was held to be partly responsible, for they helped their pupils too much. There is evidence, too, that the curriculum drawn up by the school authorities to comply with the existing regulations was unduly rigid, and did not allow adequate scope to head mistresses to meet the needs of pupils who deviated from the ordinary type. There was also a tendency to overwork the girls at games; this was partly due to the zeal and conscientiousness of the games mistresses, who were sometimes inclined to supervise and direct too much. Stress is laid on the cultivation of remedial gymnastics, particularly for girls, amongst whom postural defects are common.

Physical and Mental Differences.

Considering the general physical and mental differences between boys and girls and the possible causes of such differences, the Committee points out that though there is a mass of traditional doctrine there is a corresponding lack of precise observation and comprehensive study. But it is now certain that physiological age bears no direct relation to chronological age. Anatomically girls are in advance of boys by six months at 5 years and about one year at 15 years of age. There are material differences in the blood contents—the percentage of haemoglobin is less in the female after puberty; the male is therefore the better prepared for a more abundant liberation of energy with less exhaustion or fatigue. Except in the essential organs of sex other anatomical differences are quantitative and not qualitative. The larger male brain, while closely associated with the larger size of the body, may or may not indicate a better supply of cortical cells or co-ordinating fibrils, or it may only indicate "padding"; but there is no evidence either way. "It is therefore, at present, impossible to infer from anatomical considerations that the average male is potentially more intellectual than the average female." But it appears to be recognized that girls in general are not so strong physically as boys, and are more highly strung and liable to nervous strain. Moreover, medical statistics seem to indicate that there is a higher percentage among girl pupils of cases of anaemia, spinal curvature, defective eyesight, and minor physical defects; these defects are sometimes caused and often accentuated by sedentary occupations such as needlework.

The periodic disturbances to which girls and women are constitutionally subject condemn many of them to a recurring, if temporary, diminution of general mental efficiency, and these are most intense and pervasive in the critical years of school life. Among the intellectual processes belonging to the higher mental levels there is a difference in memory. In sheer retentiveness, especially in its lower and more mechanical forms, girls seem to surpass boys, and women to surpass men. This difference may possibly underlie the traditional view that women are the more imitative and men the more creative. In tests of ingenuity men seem to be as clearly superior as were women in tests of assimilative power. Experience with research students corroborates the common view that constructive force and initiative came chiefly from the men, while the women students almost without exceptions worked conscientiously and industriously along lines laid down for them. Beyond this little has been determined in any exact fashion, and the Committee concludes that "probably the well known formula that the male was the greater expender and the female the greater conserver of energy

covered all the differences that were not sexual in a narrower sense. It might also account for the greater intellectual vigour and adventurousness with which boys are commonly credited."

But there are other factors to be taken into account. There is a variability within the sexes; within one and the same sex the range of individual variation is, for most mental characteristics, so enormous as almost to obliterate the smaller group differences. These variations are greater in the male, so that the male sex shows the higher percentage of geniuses of almost every type, but also includes the larger number of criminals and mental defectives—an assumption which is supported by evidence that boys are inclined to break away between the upper and lower extremes in most manifestations of ability, while girls keep closer to the norm. Most witnesses agreed that these conditions are not shown until close on puberty, and there was general agreement that the average boy possesses at this age a large amount of physical and mental energy which enables him, as a rule, to surpass girls of the same age. Hence they would protect the girls from overpressure, and some were in favour of actually driving the boy during the period of adolescence.

Sex Differences and School Conditions.

Differences in response to the subjects of the curriculum are found, but many of these appear to be due to school conditions. Boys do better at classics than girls, for their teachers are the better; contrariwise girls do better at modern languages for a similar reason. Girls do better at English language and literature, for they read more, but they tend to reproduce rather than to reason. Girls know their history and geography facts better, but boys show signs of originality and freshness in their ideas. In mathematics there is a considerable weight of opinion among examining bodies affirming the relative inferiority of girls to boys in work done in this subject; girls show more aptitude for book work than for problems. The Committee is uncertain whether this is a real difference in educability or due to some school conditions or liability to fatigue; but in any case it recommends that girls should drop the subject at an earlier age, and that its teaching should have more practical applications. In science the girls are "microscopic rather than telescopic in their scientific outlook"; boys excel in experimental work, in initiative, in the capacity of judging phenomena, and in reasoning. In music the girls had the advantage of the tradition of accomplishments, the boys the handicap of the breaking voice; but it appears that the girls show a better response to rhythm, which is also observed in dancing. In drawing girls have a high sense of decoration, and under good teachers may draw, model, or paint with the directness of a man many years older and with greater freshness and charm; but the girls' work, highly expressive as it is, is usually based on less sympathetic observation than that of a boy, and is of slighter interest.

Girls suffer at games by over-supervision, and the Committee is of opinion that the authorities of girls' schools would be well advised to arrange their games more on the lines of boys' schools, where the organization of the sports is left very largely to the boys themselves. So with the out-of-school activities there is a tendency to over-organization in the girls' schools. In co-educational boarding schools it generally happens that the boys take, in practice, a larger share of the management of these activities than the girls; the boys also speak more at the debating societies than the girls. It is difficult to compare aptitude for manual work, for the sexes for the most part take different subjects. In a co-educational school the boys had the best gardens, and needlework by the boys was often more particular and exact.

The Committee concludes that "the predisposition of girls to nervous overstrain, especially at the period of adolescence, is one of the most important factors in the problem of female education." The greater liability of the girls to fatigue should be taken into account in arranging the curriculum, more especially in the co-educational day schools. It is interesting to note in this connexion that Miss Beale at Cheltenham had early to change the hours of school, which had been arranged on the plan of the boys' school. On psychological evidence the Committee judges that there is general agreement that girls are more receptive, more imitative, more amenable to discipline, and more conscientious in their work than boys, who are on the whole more independent, unruly, original, and creative. The differences do not seem to justify serious differentiation in the curriculum, except in mathematics and physics. And the pressure of uncongenial subjects should, if possible, be removed, for a time at all events, when the teacher considers that no further educational benefit is to be got from it.

The Committee points out that there is relative absence of systematic inquiry on the intellectual and emotional side differences between boys and girls of secondary school age in their bearing on education, and urges that research should be undertaken, based on wide deductions over a term of years. Such researches might reveal important facts regarding divergences of interest and differences in intellectual capacity between the sexes at various ages. Similarly, comment is made on the empirical and unscientific character of much of the available evidence on the educational achievements of boys and girls, and systematic inquiries based on experiments should be undertaken in co-educational day schools with a view to collecting trustworthy data.

Some Recommendations.

Discussing the conflict of home and school duties the Committee does not think it desirable to attempt to divorce a girl's education from her home duties and her home opportunities. No distinction can be drawn between the qualities that go to make a good parent and those that go to make a good citizen; there is a gain in a girl's feeling that her teachers appreciate the dignity of home duties, and have full sympathy with her development in this direction. And no preconceived ideas as to the best preparation, even for motherhood, ought to hamper experiment or to dim vision. All children have to be educated with two ends in view: to earn their own living, and to be useful citizens; while girls have also to be prepared to be makers of homes. Boys and girls should be educated on similar lines, though not necessarily at the same pace, so far as concerns the first two aims. The whole aim should be the cultivation of general intelligence, as distinct from the accumulation of information. Variations there must be in different parts of the country, for a general rule applying to areas so different as London, Gloucestershire, Lancashire, and Durham can hardly fail to do violence to the facts. Each area should work out its own solution of the problem in accordance with its own needs and traditions. In general, girls should have an additional year before sitting for the first school examination. There should be a wider range of subjects, more accomplishments, a lessening of university influence, greater freedom for the teaching of vocational subjects, and less home work, seeing that they have home duties; also organized games in boarding schools for girls should be materially diminished.

On the whole, the Committee is disposed to think that in many schools, and more especially in girls' schools, the daily life is over-organized. The obvious result of such methods is to produce girls and boys who, though well informed, are rather dull, and lacking in initiative and freshness of outlook. This is a serious defect, and steps should be taken to allow boys and girls, but more especially girls, more free time in which to develop their own individual interests.

The report closes with a series of appendices, of which the third and the fifth are of chief importance from the medical point of view. Appendix III gives a digest of certain points in the evidence relating to co-educational day schools (mixed secondary schools). There is here a marked conflict of evidence. The head masters of these schools were favourable to them and urged the beneficial effects upon both sexes; for the most part the women witnesses were unfavourable, to the extent of stating that "the curriculum was arranged for the boys, the school was run in their interests, and, in general, they acted as a depressing element on the girls." Most agree that no harm results in a mixed school up to the age of 11 years; then there should be separation. Serious difficulties arise in staffing, and particularly from the habit of girls to form sentimental attachments—sometimes for a particular teacher. Appendix V is a very able paper by Professor J. G. Adami (to which we alluded in our previous note) on anatomical and physiological differences between the sexes. Full weight is there given to the physiological effects of the endocrine glands, a subject which is insufficiently known to the laity. The story of the "free-martin," there given and explained, is a parable applicable to the alleged influence of the co-educational school.

As we have already stated, this report is one of singular interest and importance, and we hope that the desire of the Committee to secure detailed scientific information upon many of the points raised in the course of the inquiry may bear fruit without delay. It is a fine field for investigation, full of interest, and likely to prove of real profit.

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ACIDOSIS AND ALKALOSIS.

UNDER the somewhat forbidding title "The Acid-Base Equilibrium of the Blood" the Medical Research Council has just published a Report* dealing with the vexed questions which centre round the words "acidosis" and "alkalosis." The report is by the Council's Haemoglobin Committee, of which Mr. Barcroft is chairman, and a number of well known physiologists and representatives of clinical medicine, members. The report consists of two parts, of which the first is entitled "The blood considered as a fluid"; by this is evidently meant that it is the reaction of the plasma alone that is of direct importance. The first section of this part deals with nomenclature and its physico-chemical significance. An admirably clear account is first given of the significance of "hydrogen ion concentration," of the "buffering" to changes of reaction in blood, and of the manner in which the red corpuscles increase the buffering of the plasma. This is succeeded by a discussion of the words "acidosis" and "alkalosis." The Committee proposes to abolish the use of these words, substituting "ketosis" for the condition in which acetone and its related organic acids are present in excess, and "acidaemia" and "alkalaemia" for conditions in which the blood is abnormal towards the acid and alkaline sides respectively. Probably the use of the word "ketosis" will be found useful, since there is no necessary connexion between acidosis and the presence of excess of acetone bodies; but the rest of the proposal seems unfortunate and unnecessary. The references to the original identification with acidosis of the symptoms leading up to diabetic coma are misleading. It was not the presence of acetonuria (which had been known for long), but the close resemblance between the characters of the urine and the breathing in threatening diabetic coma and in acid poisoning that led to the search for, and discovery of, abnormal acids in the urine and blood by the experimental pathologists who made the discovery; and they had the best of reasons for concluding that it was acidosis, and not merely ketosis, which they had discovered. These reasons are still valid. "Acidosis" and "alkalosis" are, moreover, better terms than "acidaemia" and "alkalaemia," since the latter suggest that only the reaction of the blood is affected, whereas the whole of the body is involved. The abolition of the old terms would help neither clinicians nor physiologists, and might easily cause misunderstanding. It is to be hoped, therefore, that this proposal will be dropped.

The rest of the section deals mainly with the bicarbonate content, so-called "alkali reserve," and "titration alkalinity" of the blood. The real significance of these values from the standpoint of acid-base equilibrium is pointed out, though it is to be regretted that there is not a clearer account of the error which may arise when they are taken as measures of the blood's alkalinity. Thus in the alkalosis produced by anoxaemia, as well as in the acidosis of diabetic coma, they are diminished, while in the acidosis produced by true CO_2 poisoning, as well as in the alkalosis from ingestion of excess of alkali, they are increased. During the war there were many mistakes in diagnosis, gently hinted at in the introduction to the report, owing to misunderstandings in this direction. Diminution in the "alkali reserve" or "titration alkalinity" was quite commonly taken as clear evidence of acidosis.

The second section refers very shortly to methods of obtaining blood samples, and the third deals much more fully with methods of measuring or indirectly estimating the hydrogen ion concentration or reaction of blood. The principles of the hydrogen electrode method, together with the difficulties in applying it to blood, and the best method of avoiding these difficulties, are first described. This is followed by a description of the alternative, and, in its latest form, much easier, "indicator" method. In view of the probable small errors owing to slight variations in technique, etc., it is wisely pointed out that relative results are almost as valuable for most purposes as absolute results. The indirect method on the principle introduced by Hasselbalch is then described. This is at present very popular, particularly in America. There seems no doubt that, as applied to blood plasma in a test tube, it gives correct results. Whether it is equally reliable when applied in connexion with that extremely leaky test tube, the vascular system, seems somewhat doubtful. The last method discussed is that of estimating changes in reaction by observed variations in the dissociation curve of oxyhaemoglobin. Round apparent results by this method there is also a good deal of doubt.

The fourth section deals in detail with the buffering of blood. A truly head-splitting diagram (nomogram) devised by Professor L. J. Henderson is included in it. The first part ends with a short, but interesting, discussion of the buffering of the tissues, and particularly muscle. Reading between the lines of this section it is easy to see that acidosis means vastly more than mere acidaemia.

The second part of the report is rather unfortunately entitled "The relation of changes in the hydrogen ion concentration of the blood to pathological conditions of the body." What this part really attempts to treat of is the physiology and pathology of regulation of hydrogen ion concentration in the living body. The first section deals with the recorded values for hydrogen ion concentration of normal human arterial blood under resting conditions. It is clearly pointed out that although different methods give very appreciably different results, yet those by any one method are extremely close to one another—so close that it is not possible to deduce from the measurements that real differences in hydrogen ion concentration exist at different times, though it seems probable that there are very slight differences in different individuals. On the other hand, slight apparent differences have been found by several methods to exist shortly after fairly heavy muscular exertion, while quite large differences have been clearly demonstrated by Dale and Evans in animals after injection of alkali into the blood, though the breathing was still active.

The second section has the unsuitable heading, "The central mechanism of respiration," for it discusses the relations between breathing and the hydrogen ion concentration of the arterial blood and other factors. The development of the experimental work which led up to the conclusion that the rate of ventilation of the pulmonary alveoli in man depends under normal conditions on the hydrogen ion concentration of the arterial blood is first clearly traced. A minute excess or deficiency of hydrogen ion concentration, caused by slight excess or deficiency of CO_2 in the blood, immediately acts on the respiratory centre and causes an increase or diminution in the breathing, so that no more than a very slight variation of hydrogen ion concentration can be produced. It is also pointed out how the kidneys and the varying production of ammonia in the body co-operate in this regulation. The calculated differences in hydrogen ion concentration which suffice

* *The Acid-Base Equilibrium of the Blood.* Report to the Medical Research Council by the Haemoglobin Committee. Pp. 70. H.M. Stationery Office. Price 3s.

to produce great changes in the breathing, or even to cause apnoea, are so small as to be beyond the limits which can be detected by any of the existing methods for measuring hydrogen ion concentration. The probable importance of very small changes of hydrogen ion concentration in the body, and the difficulty of detecting them by direct measurements rather than by symptoms, can thus be imagined.

A very useful and suggestive discussion follows of the evidence that when changes in the hydrogen ion concentration of arterial blood are produced by other agents than CO_2 there may be no immediate response by the respiratory centre, or the response may even be the opposite of what might have been expected. It has been known for twenty-five years that although when caustic soda is injected into the blood (which can be done without any injury owing to the efficient buffering which exists) temporary apnoea is at once produced, yet when sodium bicarbonate is injected the breathing is immediately increased, although the blood must be rendered more alkaline. Clear and quite unimpeachable evidence was recently obtained by Dale and Evans that the arterial blood of animals after injection of bicarbonate does actually become far more alkaline, but apnoea is not produced. The increase of breathing after bicarbonate injection was quite intelligible so long as it was believed that CO_2 acts specifically, and not simply as an acid, on the inspiratory centre, since in the blood CO_2 is at once partially liberated from bicarbonate by the action as weak acids of the proteins, including haemoglobin. But why, if CO_2 acts only in virtue of its acid properties, is the respiratory centre stimulated when the blood, in spite of the presence of more CO_2, is actually far more alkaline? The evidence, both physiological and clinical, in favour of the hydrogen ion theory of respiratory regulation is far too strong to be upset; it is suggested that the reason why the respiratory centre reacts promptly to the minutest changes in CO_2 concentration, but only very sluggishly to changes otherwise caused in the hydrogen ion concentration of the blood, is that whereas CO_2 penetrates rapidly through the delicate membranes between the blood and living protoplasm, other substances affecting the reaction of the blood penetrate far more slowly. This is well known to be the case as regards the delicate walls of red corpuscles, and quite clear evidence has recently been furnished in plants by Jacobs that CO_2 penetrates the delicate cell membrane far more easily than various ions.

A very clear and satisfactory account is given of the effects of deficiency of oxygen on the breathing, and of the manner in which oxygen deficiency leads to an increase of the breathing at high altitudes. The next section deals with the reaction of the blood during exercise. The picture presented by this section is confused, and there is no co-ordination with the preceding section, though the possible means of co-ordination seem evident enough. The statement that there is no evidence of deficient oxygenation of the blood during muscular exertion is surprising, for it is well known that there is both direct and indirect evidence for such a deficiency.

The concluding section deals with "the relation of breathlessness to hydrogen ion concentration in pathological states." Diabetic acidosis or ketosis is first considered. The historical review of this subject is defective, and of the conclusions reached we can only say that they are not likely to convince an experimental pathologist. The breathlessness of renal and cardiac disease, and of the condition so familiar during the war under the name of D.A.H. (disordered action of the heart) are then discussed. It is surprising to find no reference to the quite different types of "breathlessness" existing in these different conditions, since the type of breathing always affords a definite clue to the cause of the abnormality. The abnormal breathing due to acidosis is, for instance, entirely different from that observed in uncomplicated heart cases or in D.A.H. The treatment of this subject is unsatisfactory, and the same is true of much of the chemical evidence quoted, though some of it is very valuable.

The defects of the report, looked at as a whole, are doubtless due largely to the difficulties of securing agreement among the different members of the committee, and the consequent recourse at many points to unsatisfactory compromises. This, however, does not diminish the great value of individual sections of the report; the defects in co-ordination between the different sections are indeed only a mirror of existing divergences of opinion. In any case, the medical profession is much indebted to the Medical Research Council and the members of its Haemoglobin Committee for the preparation of this valuable report.

THE ANNUAL REPORT OF THE REGISTRAR-GENERAL.

WE publish on another page a brief summary of the principal items in the tables of what will be called in future the Annual Statistical Review of the Registrar-General, from which will be seen that, on the whole, 1921 was a year of favourable mortality experience. Of the great causes of death, cancer alone is increasing, and the precise significance of this increase cannot be determined without a further analysis of the statistics which we cannot now undertake, especially as the age distribution of the population enumerated in 1921 does not appear to be available—presumably a consequence of the delay in taking the census, as the corresponding information was published in the Annual Report of the Registrar-General for 1911.

This first instalment of the vital statistics of 1921 differs in so many respects from its predecessors, the Annual Reports of the Registrar-General, that a few reflections upon the change will not be out of place. One change—the inclusion with the statistics of mortality of the return of notified cases of diseases—is an unalloyed benefit, and will be welcomed by all medical users of the reports. Another—the reversion from folio foolscap to royal octavo—will not be unanimously approved, because in some of the tables it necessitates the employment of a rather less legible type; but an octavo volume is so much handier than a folio that we think this change also will find a majority of supporters. Some other modifications—for instance, the omission of certain small areas but a slightly extended list of causes tabulated for areas retained—have a good deal in their favour.

But, on balance, we think the new method of presentation inferior to the old. One obvious defect in the actual tabulation is the omission of rates of natural increase. Table 1 should certainly have included the total annual births; were space a primary consideration the ratio of standardized rates of mortality on males and females could have been spared. Even the total number of births for the year of record is only to be found on page 62, and no comparison can be made with previous years. This illustrates the inconvenience of paper dichotomies, attempts to define rigidly what is and what is not of "medical" interest. It is not, however, a very important matter; what we do think important is the separation of Dr. Stevenson's review of the vital statistics of the year from the body of tabular matter.

The Annual Report of the Registrar-General of England and Wales has been for more than seventy years a document of unique scientific importance. It has gained this position owing to causes rather characteristically English which it will be interesting to consider. It has

always been the rule of this country to make non-technical administrators heads of departments; as Macaulay said, "From the Book of Dignities a curious list might be made out of Chancellors ignorant of the principles of equity, and First Lords of the Admiralty ignorant of the principles of navigation, of Colonial Ministers who could not repeat the names of the Colonies, of Lords of the Treasury who did not know the difference between funded and unfunded debt, and of Secretaries of the India Board who did not know whether the Mahrattas were Mahometans or Hindoos." The same rule has applied to minor offices, and the choice of the Registrar-General has never turned upon statistical qualifications. But, almost by an accident at the foundation of the office, a medical statistician of great genius was associated with the Registrar-General in a minor official capacity, and, thanks to the good sense of his official superior, Farr did perform all the scientific functions of the office. Even in those paragraphs of the old reports which were signed by the Registrar-General the hand of Farr can easily be detected, while the annual letter bore his signature.

The tradition has continued down to our own time. Ogle's work—despite certain improvements—was not perhaps, as a whole, of the same standard as Farr's; for that of Dr. Tatham and Dr. Stevenson, without making a suggestion which they would certainly repudiate, a suggestion that it is precisely on the same plane as Farr's, can properly be claimed that it has always reached the standard of scientific research work. Such studies as, for instance, those of Dr. Stevenson on the alleged increase of cancer or on the factors of infant mortality would have been welcomed by any scientific statistical journal or learned society in the world. But it is of the essence of genuine research work that it shall have a personal element; nobody can ever hope to reach a great truth without risking a serious error. The man who plays for safety makes very few runs. When any document is clothed with "official" authority the temptation to take refuge in safe generalities is great. By the happy accident of the old system at the General Register Office individual initiative was saved by the expedient of combining in a single publication the personal conclusions of Farr, or one of his successors, *and* the whole corpus of data. The personal conclusion might be dubious, but there was the whole material upon which it was based for the private investigator to treat if he pleased in another way, leading perhaps to another conclusion. We think this a satisfactory arrangement, and one that should, at all costs, be maintained. On that ground we deprecate the separate publication of text and tables, even if the separation means that the tables are issued a few months sooner.

RADIUM IN CANCER OF THE TONGUE, OESOPHAGUS, AND RECTUM.

LAST year Mr. Hayward Pinch, the Director of the London Radium Institute, in presenting his report for 1921, after giving statistics of all the cases treated, devoted the greater part of the space at his disposal to a discussion of the value of radium in the treatment of various gynaecological conditions. Encouraged by the approval this plan received, Mr. Pinch has this year followed the same policy, and has on this occasion devoted particular attention to carcinoma of the tongue, oesophagus, and rectum—diseases for which radium treatment is very frequently sought.

It will, we believe, generally be admitted that surgery has not been so successful in dealing with these conditions as to arouse any great enthusiasm for it as a method of treating cancer in these positions. At the same time it is obvious that from the curative point of view alone radium is still not a competitor, as the director of the Institute is emphatic in his statement that operative interference is advised and urged in every case in which it is considered to be at all possible, and radium treatment is restricted to those cases which are totally inoperable, or in which operation is definitely refused by the patient. Notwithstanding the really great results which can sometimes be obtained in these inoperable cases—the general relief of symptoms, the special relief of pain, the destruction and disappearance of masses of growth, the prolongation of life—it is still evident that the fear of delaying operation is paramount in our minds and, as much as anything else, prevents a trial of radium in many cases of early growths in which much might be expected. The newer methods of radium treatment, especially in carcinoma of the tongue—namely, the burying of radium or radium emanation in all parts of the growth in addition to the irradiation of the whole lymphatic area involved—are a great advance in technique, and when combined with the use of diathermy in the first instance give much better results than were formerly possible. The condition of patients suffering from this disease is peculiarly trying, and the pain they experience so bad, that any method of treatment which can hold out fair hope even of relief is not to be lightly put aside because it does not also include a hope of cure. Carcinoma of the oesophagus, again, is a most distressing and altogether hopeless disease; not only is it impossible to hope for cure but even relief of symptoms is very difficult to obtain, and it is disappointing that the results which were hoped for and even expected some years ago when radium was first used for this condition have not been realized. The condition is much more frequently to be met with in the *x*-ray department of a large general hospital than is generally recognized; in fact, the workers in such an *x*-ray department come to look upon it as a comparatively common disease. Of the cases applying to the London Radium Institute the site of the growth is at the cardiac orifice in 53 per cent., but we notice that only four cases were seen during 1922; we learn that the experience in Liverpool, extending over many years and amounting to several hundred cases, suggests that the middle third of the oesophagus is the common site. The most that is now claimed for the radium treatment of cancer of the oesophagus is that, to quote the report, "in favourable cases the patient is enabled to swallow food in comparative comfort for six, eight, or twelve months, or even longer, though sooner or later the exposure will have to be repeated." This statement is hardly satisfactory, as it says too little and seems to infer too much. Does it mean that at the end of the period of relief further radium treatment will bring about another period of several months' relief of symptoms, and so on? Patients may live for twelve months or so from the first onset of symptoms without radium treatment, and periods of marked improvement in swallowing may occur without any kind of treatment; in some instances these periods have been fairly long. It would be of interest to know the longest time any patient has lived in an undoubted case treated by radium. The evidence at present available falls short of establishing the proposition that the use of radium in these cases is definitely indicated.

Three ways of treating carcinoma of the stomach by radium are described: In one the abdomen is opened, radium tubes are buried in the growth for twenty-four hours, and the laparotomy wound is then closed. In the second the stomach is irradiated from the interior by passing radium tubes into the stomach through the mouth and oesophagus. In the third method radium is applied from the outside. With a knowledge of the size of the stomach, and the size and positions of cancerous

growths affecting it, and the obvious difficulty of bringing the radium into apposition with such a growth and at the same time protecting the healthy mucous membrane, the second of these methods—namely, the swallowing of the radium tube—appears to be somewhat fantastic. The difficulties of treating an accessible growth are so obvious from this report that it is difficult to imagine that any successful result could be expected in the case of a malignant growth of a hollow organ like the stomach by means of a tube of radium more or less let loose in its interior. It is perhaps to be regretted that that portion of the report which deals with the symptoms and diagnosis of carcinoma of the stomach was not more cautiously worded; many of the statements made will, we fear, be apt to mislead. It is strange that no mention is made of the value of an *x*-ray examination of the stomach; it is most important, and in diagnosis a reference to it would have made this portion of the report more accurate and of more value.

It is well known that operative procedures in carcinoma of the rectum, provided the patient applies for treatment early in the disease, give fairly favourable results. This suggests that even in the inoperable cases radium might be more effective than it is in carcinoma in other positions. The report bears this out, inasmuch as improvement is reported in sixteen cases treated during the year. Apparently a drawback to the treatment is that the rectal mucosa is, as a whole, very intolerant to irradiation; there is a danger that intractable proctitis may be set up, a condition trying both to the patient and the medical attendant. A point urged in the report is that when the condition is such that the major abdomino-perineal operation is necessary and the patient is 60 or over, then radium therapy, which can often prolong life in comparative comfort for from four to six years, is preferable to operation. This may be true in the case of some patients, but age alone should not be the determining factor, as many patients of 60 or even over are comparatively young.

Many other conditions are alluded to, and, taken as a whole, the report is written with commendable care and restraint; it furnishes a very fair idea of what can be expected from radium treatment, carried out by an expert of long experience with a sufficient amount of radium at his disposal, in a disease which is baffling in the problems it presents, and, apart altogether from its inevitably fatal results, so often means years of misery from the various symptoms to which it gives rise.

VISION AND EVOLUTION.

On January 29th Professor Elliot Smith gave the third of his series of Montgomery lectures, dealing with the general subject Vision and Evolution, at the Royal College of Surgeons in Dublin. In the first of this series, which was given in December, 1920, he discussed the problem of the reconstruction of man's pedigree for the purpose of determining exactly what changes occurred in the brain at each step in the progress of man's ancestors toward the attainment of human rank. Before the commencement of the Eocene period in a particular group of primitive tree-living mammals the importance of vision and the extent of visual representation in the cerebral cortex (already increased as the result of arboreal habits) became further enhanced, and this was responsible for bringing the Primates into existence. The continuance of this process led to the still further enhancement of vision in one subdivision of the Prosimiae known as the Tarsioidea, one member of which, the Spectral Tarsier, has persisted in Borneo, Java, and elsewhere from Eocene times until the present with practically no change. The importance of *Tarsius* in this investigation is that it represents the branch of the Prosimiae in which vision for the first time became the dominant sense, definitely displacing smell as the chief guide of the animal. The sub-order Tarsioidea has the very important significance that it represents the group from which the apes and man were derived, so that the comparison of the brain of *Tarsius* and the most primitive monkeys enables us to determine what was the nature of the process which led to the origin of the higher Primates. Professor Elliot Smith made use of the observations of the living *Tarsius*, and of photographs by Mr. W. E. Le Gros Clark, F.R.C.S., who also sent him from Borneo most of the material for the research. In the second lecture, which was given in January, 1922, the significance of the acquisition of true stereoscopic vision was discussed; the monkeys, it was explained, came into existence when one particular group of Tarsioidea acquired the powers of stereoscopic vision. The development of these higher powers of vision acted as a most profound stimulus to almost every part of the cerebral cortex. The visual area itself became further enlarged and more highly specialized, mainly for the purpose of establishing more abundant and more intimate connexions with the other cortical areas, as well as with other parts of the brain. But the change which was most noteworthy was the sudden expansion of the pre-frontal cortex, and this was due primarily to the development of a much wider range of conjugate movements of the eyes and a further development of the power of convergence. The ability to focus the two images of an object with exactitude on corresponding parts of the retinae prepared the way for the development of the macula lutea, so that the animal acquired the ability to appreciate more fully the nature of objects on the outside world, their exact position, their form, size, and texture. This stimulated the animal's curiosity to examine and handle things, which not only led to the cultivation of the sense of touch and the acquisition of higher powers of skilled movement, but also enabled the animal to train its powers of appreciating form and spatial relations and to learn by experience the meaning of events which were happening around it. This fuller understanding of the outside world gave added importance to information collected by all the senses, even the sense of hearing, and led to the further development of most of the cortical areas. The fixation of vision represents the germ of the powers of attention and of mental concentration in general. In the third lecture, which was given on January 29th, 1923, it was pointed out that the essential factor which enabled these great developments in the cerebral cortex to be brought about was in the last resort entirely dependent upon the acquisition of a wider range of conjugate movement and a much greater control over such movements to give the precision and accuracy which were essential before real vision as we interpret the word could be acquired. The development of these more extensive powers of linking up the movements of the two eyes and acquiring a more precise control of convergence was the result of a very complex series of developments in the brain. They were dependent not merely upon the elaboration of a pre-frontal cortical area, but also upon the transformation of the ocular motor nuclei in the mid-brain and certain other changes in the connexions between both the mid-brain and the cerebral cortex with the cerebellum and the vestibular nuclei. Different aspects of these problems have been elucidated by the investigations of Dr. Wilfred Harris, Mr. Treacher Collins, Professor Winkler of Utrecht, Dr. Brouwer of Amsterdam, and Professor John Hunter of the University of Sydney, and the service which the lecturer tried to render was to correlate the results obtained by these investigators with his own work on the cerebral cortex, and to interpret the respective rôles of the cortex and mid-brain in this process. The wide range of independent movement of the eyes of vertebrates below mammals becomes restricted in mammals when a mechanism for effecting automatic conjugate movements begins to develop. The extension of the range of these linked movements is acquired very gradually in man's ancestors; and the close correlation between the range and precision of conjugate movements and the development of the cerebral cortex is a clear indication of the extent to which our intellectual powers have been built

up on the basis of visual experience. The elucidation of the details of the process requires so many illustrations to make it intelligible that it is Professor Elliot Smith's intention to publish a book presenting the three Montgomery lectures, together with the three Morison lectures on the evolution of the intellect given at the Royal College of Physicians of Edinburgh in 1922, which deal with essentially the same problem from a somewhat different angle.

MINERS' PHTHISIS.

DR. A. MAVROGORDATO started the investigation of the effects of inhaled dusts on the lungs in 1913 at Oxford, under the direction of Dr. J. S. Haldane, and with the support of the Medical Research Committee. He has continued the investigation at Johannesburg, and some of his results have recently been published by the South African Institute for Medical Research.[1] The investigation has been carried on partly by experiment and partly by histological examination of the pulmonary lesions in miners' phthisis. Many interesting points have been brought out. It was formerly supposed that foreign particles entered the pulmonary tissues and did harm largely in virtue of their being sharp, pointed, and crystalline; but it is now recognized that in pneumonokoniosis the particles are seldom larger than the common micro-organisms, and are taken up by phagocytic "dust cells," and so carried into the lung; they do not get there because of any inherent penetrating properties. Dust that contains silica is harmful, and Drs. Gye and Kettle correlated this effect with the production of silicic acid. Experimentally Dr. Mavrogordato showed the different effects of dusts containing silica and of those free from it. When sterile silica is inhaled it is absorbed by macrophages which manifest "early pleural drift"—that is, they tend to flock to the visceral pleura and form pseudo-tubercles; the silica appears to preserve from autolysis the containing phagocytes, which therefore block up the lymphatics of the lung and form white fibrous tissue; the suggestion is made that lymphatic fibrosis would be a better name than the misleading term "miners' phthisis." Cross sections of the thickened lymphatics resemble pseudo tubercles, and it is pointed out that the early histological changes resemble those in tuberculosis, though giant cells are not formed. It is interesting to contrast the effects of coal dust and silica. Coal dust prevents the fixation of silica in the lung, though experimentally it cannot remove it when once it has got into the lung; it is well known that coal-miners do not develop miners' phthisis. On the other hand, when silica has gained an entrance to the lung and damaged it by interfering with the lymphatic circulation and its power of dealing with coal dust, the carbon accumulates in that region and so accounts for the pigmentation. If, therefore, coal dust or its equivalent were to be employed as a means of preventing silicosis, it would have to be provided at the same time as exposure to quartz dust. There is a most important difference between sterile silicosis as described above and infected silicosis, in which the pulmonary changes are more widely spread, the clinical course much more severe, and the damage not necessarily curable by discontinuance of exposure. Much depends on whether the infective agent is the tubercle bacillus or not. There may be three stages in silicosis: simple irritation, non-tuberculous infection, and finally tuberculosis; it is difficult to say in what proportion of cases the infection is first of a non-tuberculous nature and later tuberculous. The old type of disease characterized by cyanosis and right-sided cardiac failure, still familiar in Cornish miners, has become rare in the Rand mines, and early tuberculous infection has become common; the change of type of disease has coincided with a change in the nationality of the miners, from West Europeans to Africanders, and in the atmospheric conditions of the mines, formerly dry, now moist and less dusty, as a result of the application of the wet process work to control the dust. Whether or not the mines have become gravely infected with the tubercle bacillus has not been established.

[1] *Publications of the South African Institute for Medical Research.* Edited by W. Watkins-Pitchford, M.A. No. XV. *Studies in Experimental Silicosis and other Pneumonokonioses.* By A. Mavrogordato, M.R.C.S., L.R.C.P. Published by the Institute, Johannesburg. 1922. (Pp. 58; 114 figures. 5s.)

VITAL STATISTICS OF ENGLAND AND WALES IN 1921.

THE tables of the Registrar-General's Statistical Review of England and Wales, which have just been published,[1] contain most of the tabular matter formerly issued in the Annual Report of the Registrar-General. In the year 1921, 848,814 births and 458,629 deaths were registered; the death rates, both crude and standardized, are the lowest recorded, being respectively 12.1 and 11.5 per 1,000 persons; the corresponding rates for 1920 were 12.4 and 12.1. Forty years before, in 1881, the standardized rate of mortality was 18.2; in 1891 it was 20 (an influenza year); in 1901 it was 16.9, and in 1911 14.2. In spite of the dysgenic selection due to war, the rate of 1921 is substantially below that of 1911. The rates in age groups at all ages below 65 and for both sexes were lower than or equal to those of 1920. At ages over 45 the improvement is slight, in the first two quinquenniads it is substantial. The ratio of deaths under 1 to births, although very slightly in excess of the figure for 1920 (83 in 1921, 80 in 1920), is, with that exception, the lowest ever recorded. This is perhaps the most gratifying feature of all, since 1921 was a record summer, and might have been expected to take a heavy toll of infant life. In 1911—the hottest summer in living memory excepting 1921—the infant death rate was nearly 25 per cent. greater than in 1910—130 in 1911, 105 in 1910. Turning to the causes of death we notice that cancer alone of the chief factors of mortality has increased its hold; the rate of mortality from this cause was higher than in any previous year except 1918, the increase being more amongst females than males. In 1921 cancer was responsible for rather more than 10 per cent. of the total number of deaths, tuberculosis for 9 per cent. In 1911 cancer was credited with less than 7 per cent. and tuberculosis with rather more than 10 per cent. of the whole number. The five great groups of disease forms—heart diseases, cancer, tuberculosis, pneumonia, bronchitis—comprise almost half (46 per cent.) of the total mortality. Regional mortality exhibits the usual features, being higher in the northern than the midland or southern areas. Thus Darlington (12.3) was the only one of the five county boroughs within the geographical county of Durham recording a crude rate of mortality below 14 per 1,000. Of the six East Anglian county boroughs (East Ham, Southend, West Ham, Ipswich, Great Yarmouth, and Norwich), Great Yarmouth (12.9) had the highest death rate. The lowest rate of infant mortality in the Durham county boroughs was 96, the highest in the East Anglian county boroughs 75. In the metropolitan boroughs, the rate of infant mortality ranged from 54 in Stoke Newington to 111 in Shoreditch. The rates of mortality from the principal infectious diseases were favourable. The rate per million persons of enteric fever was slightly higher than in 1920, but less than in any previous year; measles had much the lowest rate of the present decennium; scarlet fever, which was very prevalent, had a lower death rate than in 1920, as had diphtheria. In the whole of England and Wales, 315 cases of small-pox were notified; 106 were of persons in the city of Nottingham, 92 in the West Riding of Yorkshire, 40 in Middlesbrough, 16 in Derbyshire, and but 2 in London. Five deaths from small-pox (all males) were registered. The number of deaths attributed to influenza was 8,995, the smallest number since 1917. Malaria was credited with the deaths of 139 males and 4 females; in 1920 there were 240 deaths of males and 10 of females so described. Encephalitis lethargica was returned in 729 cases, a considerable increase over 1920—480 deaths. A new feature of the report is the tabulation of cases of notified infectious disease, which occupies fifty-two pages.

[1] *The Registrar-General's Statistical Review of England and Wales for the Year 1921. Tables, Part I. Medical.* H.M. Stationery Office. 1923. (Pp. 482. 15s. net.)

LOCAL GOVERNMENT AREAS.

THE rapid—in some instances phenomenal—increase in the population of many towns in England and Wales during the past forty years has added greatly to the difficulties of administration, and has created many anomalies. In some cases encircling belts of rural areas have become urbanized but still retain the administration of a rural district, while in others contiguous urban districts have so spread out their suburbs that, meeting each other, it has been wellnigh impossible to define the precise boundaries. An excellent example of the latter is to be found in the Staffordshire Potteries—Mr. Arnold Bennett's "five towns"—which during Mr. John Burns's presidency of the Local Government Board were formed into the county borough of Stoke-on-Trent. In more recent years many applications have been made to the Local Government Board or the Ministry of Health for sanction to extensions. Some of these have been granted and others refused. The refusals have caused much heart-burning in the districts concerned, for the central department did not appear to have any settled policy. In these circumstances the action of the Government will be generally approved in appointing a Royal Commission "To inquire as to the existing law and procedure relating to the extensions of county boroughs and the creation of new county boroughs in England and Wales, and the effect of such extensions or creations on the administration of the councils of counties and of non-county boroughs, urban districts, and rural districts; to investigate the relations between these several local authorities; and generally to make recommendations as to their constitution, areas, and functions." The reference, as will be seen, is wide, and we are glad to find that it includes the investigation of the relations between local authorities and the making of recommendations as to their constitution, areas, and functions. The additional duties which the Legislature in recent years has cast upon local authorities, most of them of necessity requiring the appointment of special officials to carry them out, has resulted in a considerable amount of overlapping and consequent extravagance in administration. All this may be rectified by thorough inquiry and well considered recommendations. Many instances of anomalies might be given. The rural district of Chesterfield, with 76,000 inhabitants, has a larger population than there is in each of eleven English and Welsh counties; the population of Wrexham rural district (63,000) is larger than that in each of six Welsh and three English counties; and the population of the Rhondda urban district (162,000) is only exceeded in two of the Welsh counties, and it is higher than that in eight English counties. No exception can be taken to the constitution of the Commission, which includes representatives of counties, county boroughs, urban and rural districts. The Earl of Onslow will be chairman, and Mr. Michael Heseltine, of the Ministry of Health, Whitehall, S.W.1, secretary.

QUAKER RELIEF IN STRICKEN EUROPE.

IN these troublous times our view of Europe is apt to be limited by our own immediate wants and difficulties. We remember the Russian famine, but few of us perhaps realize the present state of affairs in the devastated lands of Austria and Poland, as well as Russia. In a film, "New worlds for old," the work of the Relief Committee of the Society of Friends in meeting the crying need of these populations is vividly displayed. In Vienna there was overcrowding in the poorer parts. The Society supplied materials for houses, and the actual building was done mainly free of charge by the people themselves. To remedy the food shortage seeds were given, and to meet the shortage of milk the Society sold cows to farmers, to be paid for in milk. The milk so received was distributed to children and tuberculous patients. The acute distress among the middle classes was not forgotten. Parcels of food were distributed to many whose annual pensions would not at the present time suffice to pay for a week's supply. Many of the women were able to do needlework, which was paid for by the Society in food. The population of the devastated areas in Poland is urgently in need of help. The pictures showed refugees still trekking back to their homes over the immense snowy plains, sometimes in small sledges, sometimes walking. Often they succeed in reaching their village, only to find that their home has disappeared, and that a young forest of pine trees is growing up on the land which they once cultivated. Their only refuge is often a mud hovel. One such dug-out, 6 ft. by 4 ft., is shown in which a whole family lived with their cow and their pig. Fortunately wood is plentiful, and the Government gives timber for building, while the Society provides tools and transport. The peasant himself does the work, so a house can be built at the cost of £9. Food, clothes, seeds, and implements are all required to start these peasants in life again, but by spinning, weaving, and embroidery they are able to pay for a great part of what is required. Famine conditions still prevail in the Buzuluk district in Russia, for the harvest failed again last year. Medical relief as well as food has been provided, and must be continued till the harvest of 1923 if the district is to be saved. The Society of Friends has kept before itself the ideal that men must be helped to help themselves; the people go back to their natural avocations. In return for their work they receive the necessaries of life and the means to restore them to prosperity. Their gratitude is sincere, and the exertions of the Society in the lands where it has worked will not soon be forgotten.

PASTEUR CELEBRATION.

THE centenary of Pasteur will be celebrated at a social evening of the Royal Society of Medicine on Wednesday, February 28th. The President, Sir William Hale-White, will give an address on Pasteur in relation to medicine, and Professor T. M. Lowry, F.R.S., Director of the Laboratory of Physical Chemistry, Cambridge, will give a short lecture on Pasteur in relation to chemistry. Afterwards Dr. Gustave Monod will speak on Pasteur as an artist, illustrating his remarks by lantern slides of some of Pasteur's drawings. The French Ambassador does not expect to be in this country at the time, but the French Consul-General will be present. Invitations have been issued to other representative Frenchmen in London, and members of the profession are invited to attend.

DEAN INGE will give an address on a subject relating to religion and medical sociology at the meeting of the Marylebone Division of the British Medical Association which will be held at the house of the Medical Society of London, 11, Chandos Street, on Friday, March 2nd, at 8 p.m. Members of the medical profession who are not members of the Association are invited to attend this meeting.

Medical Notes in Parliament.

[FROM OUR PARLIAMENTARY CORRESPONDENT.]

The New Session.

THE King's Speech at the opening of the new session on February 13th, though it did not raise any fresh issues of a striking character, indicated a programme of larger dimensions and greater variety than had been anticipated. To the usual paragraph about the estimates for the public services was appended the observation that the financial burdens of the country were heavy, and that reductions in public expenditure remained essential to the well-being of the State—an intimation, in short, that further cuts are contemplated. Proposals will be made to grant credit facilities to agriculturists, to remove anomalies in local taxation, to deal with unemployment insurance benefit, housing, trade boards, and industrial insurance. Certain of the recommendations of the Committee on the Restrictions of Rents Bill are to be embodied in a bill, and measures will be submitted for simplifying legal procedure, effecting economies, especially in the county courts, and consolidating various branches of the law. From the medical point of view the principal comment in the lobby on this outline of work for the coming session was that health interests will apparently be indirectly rather than directly concerned in the legislation to be proposed. But the King's Speech is never drawn up to comprehend all that is intended to be done or attempted. Moreover, private members will have greater facilities at certain sittings each week than was the case during the last Parliament.

England and Wales.

EAST LANCS (TERRITORIAL) WAR MEMORIAL.

On Saturday, February 10th, an extremely impressive service was held at the Manchester R.A.M.C.(T.) headquarters on the occasion of the unveiling of the memorial to the officers, nurses, and men of the 42nd East Lancs Division who gave their lives in the great war. The memorial takes the form of three canopied tablets with the names of the nine officers, seven nurses, and 177 other ranks placed above a semi-column containing the dedication:

TO THE GLORY OF GOD
AND IN PROUD AND GRATEFUL MEMORY
OF THE OFFICERS, NURSES, N.C.O.S, AND MEN
OF THE R.A.M.C.
WHO SERVED WITH THE EAST LANCS
DIVISION T.F.
WHO GAVE THEIR LIVES
IN THE SERVICE OF THEIR KING AND COUNTRY
DURING THE GREAT WAR.

It is surrounded by bronze pillars and chains, and is a fitting companion to the memorial to those of the corps who fell in the South African war.

After the inspection of the guard by Lieut.-General Sir John Goodwin, Director-General A.M.S., the hymn "God of our fathers" was sung by the troops and an assembly of about 500 doctors, nurses, V.A.D.s, and Red Cross men who had gathered to do homage to their fallen comrades. Colonel W. Coates, in asking the Director-General to unveil the memorial, referred to the units which had originated in the East Lancashire Division: the 18th Field Ambulance, the first Territorial unit on foreign service in France, September 6th, 1914; the 65th Division, trained here after the departure of the 42nd; the 33rd General Hospital in Mesopotamia and the 57th General Hospital in France; the 64th Casualty Clearing Station; and at home the 2nd Western General Hospital, starting with its 520 beds and developing, with auxiliaries, to over 20,000 beds, which dealt with over 850,000 casualties. The difference in service between the combatant forces and the medical service was emphasized. Personal reference was made to the deaths of some of the officers and to the seventy-five who were drowned in the Aegean Sea.

The Director-General, after unveiling the memorial, mentioned his personal acquaintance with the 18th Field Ambulance and the 66th Division in France, and later referred to the hospital work at home, giving special praise to the Red Cross service, particularly to the transport branch. He concluded his short and direct address by emphasizing that these "without any personal advantage or gain in a spirit of loyalty and devotion served their fellows. That spirit still survives with us, and so long as it does England can never go down." After Canon Scott, the Subdean of the Cathedral, had dedicated the memorial, the buglers sounded the Last Post.

In asking Sir Frank F. Adam, the chairman of the East Lancs Territorial Association, to accept the custody of the memorial, Colonel Westmacott referred to the question of the utility of such mementoes, and said this was placed in position by the comrades of the fallen, not only to recall their memory, but also for those who came after but knew them not as an incentive to them, and as a standard of what must be required of them. After Sir Frank Adam had accepted the custody, and Lieut.-Colonel Callam had offered thanks to the Director-General and others, the hymn "O God, our help in ages past" was sung, and the réveillé terminated a very touching ceremony.

WELSH NATIONAL SCHOOL OF MEDICINE.

The Royal Commission on University Education in Wales, of which Lord Haldane was chairman, recommended in its report (1918) that the Welsh National Medical School should be a constituent college of the Welsh University rather than an integral part of the University College of South Wales and Monmouthshire at Cardiff. The recommendation of the Royal Commission was not accepted; the medical school has been established as a part of the University College, Cardiff, and that college some time ago presented a petition to the Privy Council for a supplemental charter embodying this arrangement. The Court of Governors of the University College had before it on February 8th a letter from the Privy Council containing the following passages:

"Their lordships, after careful consideration of the whole problem, have come to the conclusion that, in order to avoid most of the difficulties inherent in the scheme as it now stands, it will be best to constitute the National School of Medicine a separate constituent college of the University of Wales to be governed, under the University, by a council and senate of its own, as recommended in the report of the Royal Commission on University Education in Wales (see paragraph 216 of report).

"Their lordships are of opinion that not only does the change of plan proposed appear to be the best expedient on the ground that the interests of the school and the college alike would be better served if the school were administered as a separate institution, but that the views of many of the bodies who at the date of the Royal Commission's report dissented from this portion of its recommendations have undergone a substantial modification."

Dr. T. H. Morris (Cardiff) pointed out that there was a good deal to be said on both sides. While it was true that the reports of the Board of Medicine had to be approved by the college council, that body could not alter a report but only suggest amendments. If the two bodies did not agree on any point it had to be referred to the University, which alone had a veto on the Board of Medicine. This, in his opinion, was practically the same thing as making the medical school a constituent college of the University. He moved that the letter from the Privy Council should be referred to the council of the University College for consideration and report. After considerable discussion Dr. Morris's motion was carried unanimously. The council at its meeting of February 9th appointed a special committee to report upon the whole subject.

THE LONDON RADIUM INSTITUTE.

The London Radium Institute (Riding House Street, Portland Place, W.1) has possessed a small in-patient department since October last. This arrangement permits the combination of surgical procedures with radium therapy, and thus enables radium to be applied in the most effective manner possible in such situations as the oesophagus, the uterus, and the bladder. It also makes it possible to administer larger doses in a shorter time. This so-called "intensive radium therapy" has given most encouraging results in lymphadenoma, leucocythaemia, lympho-sarcomata, and mediastinal tumours; but it is recognized that much careful observation and long clinical experience will be required to determine the limits of safety of large doses. Though the phenomena attendant upon the immediate systemic disturbance which follows a heavy dose of radium are well known, the possibility of later consequences, such as interference with the internal secretions, blood changes, and atrophy of the mucous glands, must be constantly kept in mind. A diathermy apparatus of the latest pattern has been installed, as that method is considered to be of value as a preliminary to radium treatment when dealing with extensive fungating growths of the palate, vulva, bladder, and other parts. The exuberant masses are thus completely removed, and subsequent treatment of the base and edges of the growth, with numerous small platinum screened tubes, leads to the degeneration of any isolated scattered foci in the normal tissues and excites a protective fibrosis.

The total number of new cases seen during the year was 804. It appears from the table given that the total number of patients suffering from carcinoma who applied was 306; of these 35 were examined but not treated and 4 abandoned treatment; from 60 no recent report has been received and 20 received prophylactic irradiation only; 16 were apparently cured, including 3 cases of cancer of the breast and 2 of the uterus; 110 cases of cancer were improved and 50 were not improved. The cases of cancer of the breast treated numbered 63; of these 12 received prophylactic irradiations only. Of the remainder 3 were apparently cured, 28 improved, and 10 not improved; 2 died, and from 8 no recent report has been received. The results in rodent ulcer were remarkably good; of 138 cases in which the result could be traced 102 were apparently cured, 34 were improved, and only 2 not improved. Of the miscellaneous non-malignant cases treated it may be noted that of 20 cases of arthritis deformans 11 were improved, and of 7 cases of spring catarrh 1 was cured and 6 improved. With regard to the terms used the report contains the following statement:

"The column 'cured' refers only to cases of a non-malignant nature, as it would be unjustifiable to claim as 'cured' cases of malignant disease which have been treated for the first time during the past year.

"The term 'apparent cure,' used in relation to cases of malignant disease, must be interpreted as representing a condition in which all trace of the original lesion or lesions has disappeared, in which there is no sign of any recurrence, and in which the patient is, so

far as can be determined by a thorough and careful examination, free from any indication or symptom of the disease.

"Cases have been classed under the heading 'improved' only when the result of treatment has been to produce a definite and marked degree of benefit, either in the direction of retardation of the progress of the disease, diminution in the size of a growth, healing of ulceration and arrest of haemorrhage and discharge, or of relief to such subjective symptoms as itching, tenderness, pain, dyspnoea and dysphagia."

Altogether 8,620 treatments were administered during the year, of which 4,165 were given free of charge to necessitous patients.

The demand for the loan of radium emanation apparatus has increased so much as to be an important part of the work of the Institute: the number of such applicators prepared during the year and distributed to hospitals and medical practitioners was 887. Advice is freely given to any medical practitioner on the treatment of disease with emanation, and if precise information is furnished as to the nature and extent of the disease or growth suitable apparatus with full instructions is usually sent within two or three days. It is found that in the case of patients of very advanced age, enfeebled constitution, crippled condition, or suffering from disabilities of any kind which prevent them from journeying to London, effective radium treatment can often be successfully given at the patient's home by his own medical attendant, by the use of emanation apparatus of appropriate strength and suitably screened.

Of the patients suffering from malignant disease who attended the Institute the condition in the majority was inoperable, so that the prospects of obtaining even an apparent cure were slight. No case, however, is refused if there is believed to be any chance of improving the patient's condition, lessening pain, and prolonging life. In a few such cases the results have exceeded the most sanguine anticipations.

The body of the report is devoted to a consideration of radium therapy in diseases of the alimentary canal and its accessory glands. It is, in fact, a monograph on this subject and is likely to be as much appreciated by the profession as was the similar essay on radium therapy in gynaecology published in the report for 1921. Particular interest attaches to what Mr. Pinch has to say about the radium treatment of carcinoma of the tongue, oesophagus, and rectum, and to this matter we refer at some length elsewhere (p. 297).

A brief report on the Research Department is contributed by the Director, Dr. J. C. Mottram. The results of the researches in which he has taken part have already been published in the *Proceedings* of the Royal Society and in the *British Journal of Experimental Pathology*. A report by Mr. W. L. S. Alton, F.I.C., Director of the Chemico-Physical Laboratory, contains an illustrated account of the apparatus used at the Institute for the preparations of emanation applicators by a chemical method, which will be demonstrated to persons interested who will make an appointment with Mr. Alton at the Institute.

Scotland.

PROPOSED PRESENTATION TO DR. MATTHEW HAY.

A LARGE and influential committee has been formed for the purpose of presenting Professor Matthew Hay, M.D., LL.D., medical officer of health for the City of Aberdeen, with his portrait or bust in recognition of the devoted and eminent services rendered by him to the City and University of Aberdeen during the last forty years, as well as his powerful influence on the progress of preventive medicine and public health throughout the country. In appealing for subscriptions the committee does so in the confidence that its appeal will meet with a cordial and widespread response from all who are acquainted with Dr. Hay's high character, his acute and impartial mind, his scientific attainments and powers of organization, his fine influence as a teacher, his great place in the medical councils of the nation, and his unceasing and most generous labours in the public interest. Subscriptions (limited to two guineas) should be sent to Major H. J. Butchart, D.S.O., at Marischal College, University of Aberdeen, who is honorary secretary to the committee.

THE HEALTH DEVELOPMENT OF EDINBURGH.

A series of lectures on the literary and social history of Edinburgh has been arranged by the Edinburgh education authority, and the third of these, entitled "The development of Edinburgh from the health point of view," was delivered by Sir Leslie Mackenzie on February 8th. For generations, said the lecturer, Edinburgh had been badly handled, and the nineteenth century found the administrative organization hopelessly inadequate for the new problems forced upon them. It was formerly considered good civic practice that the water supply of a great and rapidly growing city should be in the hands of a private company, whose primary concern was to make dividends. In the early days the various sections of the city had to rely for water upon deep wells, but later the idea of a gravitation supply was developed. As early as 1621 the Scottish Parliament empowered the city to bring in such a supply, but for some reason it was not brought in until fifty years later. By 1840 the water supply was plentiful, but it was in the hands of the water company, and for many years the struggle went on to transfer from the company to the city the powers and duties of providing water. He looked upon the appointment in 1862 of Sir Henry Littlejohn to the office of medical officer of health as marking a new departure in civic thought. Great problems were still with them, particularly tuberculosis and venereal disease, but the organizations that were dealing with them were active, and the toll of death was going steadily down. It was only within the last thirty-three years that the tuberculosis problem had come to be seriously tackled, and in this one Edinburgh citizen, Sir Robert Philip, had set the pace almost for the whole world. Another great health expansion had been the medical inspection and treatment of school children, which could be dated from the year 1903, when the Scottish Royal Commission on Physical Training issued its report, and recommended the medical inspection of school children. The scheme of maternity and child welfare was another great development which had sprung, under the stimulus of the war, from the voluntary system of health visiting.

HOUSING IN SCOTLAND.

At a meeting of the Eastern District Committee of Stirling County Council on February 8th an application was made for sanction to erect twenty-four houses of three apartments, and eight houses of two apartments, with scullery, bathroom, etc. Dr. Adam, county medical officer of health, pointed out that under the Housing Act houses of three apartments were the minimum unless there were special circumstances to warrant two apartments. Mr. T. D. Wallace said that the conditions laid down by the Scottish Board of Health were hindering the building of houses. The chairman, Captain Harvey, remarked that the Board of Health was now willing to consider a certain proportion of two-roomed houses. Dr. Adam said that approximately 50 per cent. of the population of Scotland were living in two-roomed or smaller houses, a condition of affairs which should not persist. The matter was remitted to the Public Health Committee.

Ireland.

LOCAL GOVERNMENT BILL (IRISH FREE STATE).

THE Local Government (Temporary Provisions) Bill was read a second time at a recent meeting of Dail Eireann. In 1919 the Local Government Board, which then administered under the British Government, withdrew the usual health and other grants to the local authorities unless they undertook to carry on local administration as hitherto. The result was that nearly all the local boards and councils severed their connexion with the Local Government Board, and there was formed, to meet the new situation, a Local Government Department under Dail Eireann which discharged, in the twenty-six counties, practically all the functions of the old board, and carried out important reforms. In the Free State, with the exception of a few counties, all the boards of guardians —they averaged six for each county—were abolished; their functions under the Medical Charities and other Acts relating to health are now administered through a health board or committee, one for each county. There is no fixed number of members for a county health board, but it generally consists of about thirty. They are appointed by the county council, and most of them are members of that body. In a few counties the medical practitioners were asked to nominate representatives for the county health board, and at present there are two medical practitioners on the health boards for Clare and Wexford. That medical representatives should be appointed on the county health boards was a recommendation

made in the report of the Irish Public Health Council. The Irish Public Health Council, in making this recommendation, suggested that medical officials—for example, dispensary workhouse doctors, etc.—should be eligible for membership; the object was to bring the county health boards into closer touch with their medical officials in order that there may be better co-operation in administration.

It seems evident that Section 13 of the new bill is specially drafted to prevent county health boards having as members part-time medical officers who are employed by these boards or any other local authorities. This section can only be regarded as a very retrograde step, as it will deprive the county health authorities of expert medical advice in administrative matters which they have at all times badly needed. Nor will it help that co operative spirit between health authorities and their medical officers which is so essential to success in Irish medical administration. Section 10 of the bill provides for the superannuation of officials whose offices are abolished as the result of the recent amalgamation of workhouses and their hospitals. This section has for its main object the radical alteration of Section 8 of the Local Government Act, 1919, which was to protect existing officers of local authorities from arbitrary removal from office, and to give to every such officer who had become incapable of discharging his duties owing to permanent infirmity, or who attained 60 years of age and had served in his office for twenty years, the right to retire on a pension. Under the eighth section of the Local Government Act, 1919, the local authority, irrespective of the number of years served by an officer, may vote him a maximal pension of two-thirds of the salary, fees, and emoluments which he was in receipt of at the time of removal or resignation, or a minimal pension of not less than an allowance, in accordance with his years of service, calculated as provided by the scale under the Superannuation Acts, 1834 to 1892. If the new bill becomes law in its present form it will only secure an official the minimal pension as calculated previous to the passing of the Local Government Act, 1919.

The Minister for Local Government, in moving the second reading, stated that its chief purpose was to regularize certain things that had been done without legal sanction during the Anglo-Irish war. If the bill became an Act it would cease to have force after March 31st, 1924. In the meantime he hoped the Government would bring forward a very comprehensive reform of the entire Poor Law system, including the Medical Charities Acts.

Correspondence.

STATE HOSPITALS.

SIR,—My attention has to-day been called to a letter signed by the senior medical officer of the Walton Infirmary and published in the BRITISH MEDICAL JOURNAL of February 3rd. The writer quotes some observations of mine on State hospitals abroad, and treats them as applying to Poor Law infirmaries in this country. I have never spoken of the officers and staffs of these institutions except with the greatest regard and admiration for their services to the sick and ailing, and Dr. MacWilliam is entirely mistaken in supposing that my criticism applied to them.—I am, etc.,

Richmond, Surrey, Feb. 8th. CAVE.

HOSPITAL POLICY.

SIR,—I am glad to see that the discussion on this is being continued, for I am certain that it is one of the most important, and yet most difficult, matters that the profession has to consider. The hospital-using public recognize the great debt that they owe to the honorary staffs, and would like to make them some return; but I do not think the time is ripe for that return to be direct payment from contributory funds, especially as nearly all those funds are being collected with the understanding that the payments are solely for maintenance. The differences of opinion in the profession are very marked, some wishing to retain the present purely honorary system, some to receive a peppercorn acknowledgement (these having an eye on future developments), and some frankly wishing to receive definite payment.

There is one method that might reconcile these divergent opinions, and which would, I think, meet with the contributors' approval. Could not a definite proportion of all money paid by patients be put to a pension fund? The age at which this might be drawn should be a fairly early one, say 55 or 60, so as to give the younger men a chance of getting on the staff without such a very long wait. Although pensioned, the retiring members could be made use of for consultant and special work. I have not yet sounded contributory members as to this, but I am pretty certain that it would meet with their approval. Hospitals, too, will be able to afford this when contributory schemes become, as I think they will, universal.—I am, etc.,

L. S. LUCKHAM,
February 12th. President, Salisbury Infirmary League.

SIR,—Dr. Flemming (February 10th, p. 261) allows that the policy of the Council has not even now been adequately discussed, and is not yet, in 1923, ripe for presentation to the public. I agree most heartily, and therefore cannot excuse those who in 1921, by methods which I detailed with absolute accuracy in my letter of December 16th, 1922, foisted this policy upon us at Newcastle. What plea can now be urged for men who laid upon us then a duty which only one of them has even yet dared to undertake himself, and which Dr. Flemming still to-day declines? The suggestion to tax small individual payments is not only repulsive to a large body of the profession, but never had the remotest chance of general acceptance by the laity. Therefore a compromise is necessary, and that which we suggest is reasonable, can be defended before lay boards, and was accepted by a majority at Glasgow. What more can be asked for? Whereas Dr. Flemming frankly allows that he would not attempt to approach any hospital board with his proposal, I have not only done so, but secured the approval of our board to mine, conditional upon its acceptance by the British Medical Association. When supporters of the Council can claim the like I shall begin to take them seriously, but not before.

In our hospital, which typifies many provincial county hospitals in rural areas, many contributors who can pay are able to afford but 10s. weekly or less—in fact, not enough for the "bare necessaries of life." I deny absolutely the "important premiss" which he quotes. I do not for one moment allow that these small individual contributors can be considered to pay for our services by such means. I would go farther and state emphatically that to encourage in them any such notion would be a blunder in policy of the first magnitude, calculated to react most injuriously upon the status of our profession now, and yet more disastrously in the future, should hospitals be taken over by the Government or municipal bodies. As regards contributory schemes, there is a vast difference between a great insurance scheme, involving in the mass a large sum of money, carrying definite obligations undertaken by the hospital, and securing admission in priority for its beneficiaries, and a payment for services actually rendered, by a person admitted solely on his merits. Therefore my classification is quite legitimate. I would suggest that where the payment is made by the patient or his relatives, only the excess over that required for maintenance be taxed, but in all other cases the total sum actually paid for the patient, or, in the case of mass contributions, a sum agreed between the staff and the board, be the basis for assessment.

I do not think it possible to make cast-iron regulations to govern all hospitals alike, and one of the great advantages of our scheme over that of the Council is that it allows latitude of interpretation as to what constitutes maintenance, and can therefore be varied to suit local conditions. In our hospital we agreed to accept 30s. as cost of maintenance. I would ask Dr. Flemming to give this proposal more careful consideration than it has yet received, always bearing in mind that the ultimate decision lies, not with the profession as he implies, but with lay boards of hospitals, and that it is quite impossible to coerce the latter, seeing that they are unpaid, and can resign at any moment without loss to themselves if we annoy them. Has Dr. Flemming considered in detail exactly what we should do in such event? It is an interesting problem which I submit to the earnest attention of the Council and Hospitals Committee, before they embark upon a rash and ill considered adventure, which can have only one end, and that a pitiful one. I would again point out that neither Dr. Flemming nor anyone else has even hinted how, when the staff and lay board are both paid, hospitals shall be financed, yet retain one shred of that voluntary control for which the Council and Hospitals Committee profess such reverence; yet we are assured that payment of lay boards

will necessarily result from the acceptance of their policy. It follows that we must choose between rejection of this policy and rejection of the voluntary system. The answer will be given at Portsmouth. Finally, as regards "token payments," seeing that no legal question of property rights can conceivably arise, I am at a loss to understand on what grounds a proposal so fantastic can possibly be defended. Does anyone imagine we are going to approach our lay boards with a proposition so absurd?—I am, etc.,

Chichester, Feb. 10th. G. C. GARRATT.

THE DANGEROUS DRUGS REGULATIONS.

SIR,—In the letter from Colonel Smith in your last issue I am doubtful whether by "British Medical Councils" he means the General Medical Council or the Council of the British Medical Association. If it be the former the matter must rest until the May session of that body. If, however, he should mean the Council of the British Medical Association he will find, by reference to the reports of the Representative Meeting, of the Council acting through its appropriate (Medico-Political) Committee, and to Current Notes *passim*, as published in the BRITISH MEDICAL JOURNAL, that on the introduction of the first draft of the Dangerous Drugs Regulations the Council took very strong objection to them *in toto*, and reinforced that objection by letter and interview. The result was that certain modifications were introduced, but they were not improved sufficiently to satisfy the Association. Working in conjunction with the pharmacists, the Association requested the Home Office to appoint a Select Committee which should be competent to bring these regulations into a form which, while protecting the public, should safeguard the interest both of the medical and pharmaceutical professions. On this being refused letters were sent round to all Divisions and Branches of the British Medical Association, asking them to approach the members of Parliament for their districts and to request them to attend a meeting at the House of Commons, when the case for alteration and modification of the regulations would be put before them. As a result of this action a meeting of over 200 members of Parliament was held in one of the committee rooms of the House and the case for doctors and pharmacists most ably put before them by Dr. Cox, the Medical Secretary of the Association, and by Sir William Glyn-Jones. While this meeting was in progress a message was brought in from the Home Secretary announcing that he had decided to appoint a Select Committee as requested. As a result of the deliberations of this body the regulations were reintroduced in a very much more satisfactory form, to which no objection was taken by the Council of the Association.

When the new regulation which prohibits the doctor from prescribing certain dangerous drugs for his own use was contemplated, the Medical Secretary and I met Sir John Anderson and Sir Malcolm Delevigne at the Home Office, and vainly endeavoured to convince them that the regulation as proposed was useless and impossible to carry into effect.

At the present time the matter is receiving active attention at the hands of the Medico-Political Committee, which is collecting evidence as to the working of the regulations throughout the country. The Insurance Acts Committee has also protested against regional medical officers of the Ministry of Health being employed as inspectors under the Dangerous Drugs Regulations, and there at present the matter rests. Perhaps, on the whole, it may be better to have a medical practitioner as an inspector rather than a policeman.—I am, etc.,

February 12th. E. B. TURNER,
Chairman of the Medico-Political Committee,
British Medical Association.

THE SURGERY OF THE PROSTATE.

SIR,—I have no desire to disturb the charm which "the directness and economy of means employed" in the "classical" operation of Freyer appears to exercise on Mr. Gerald Ralphs; but I feel that I ought to comment on some of his criticisms of my recent article on prostatectomy, published in your columns (February 10th, p. 259). I am surprised to learn that "many urologists" in this country use the two-stage operation as a routine procedure. I had not heard of their "increasing partiality."

To be forced into doing a routine two-stage operation because the majority of cases of enlarged prostate are "potentially uraemic" is absurd. The term is so vague as to have no weight in deciding whether a one-stage or a two-stage operation should be performed.

Mr. Ralphs quotes the writings of Sir Peter Freyer to prove that there is never any difficulty with the abdominal wall and never any bleeding that cannot easily be controlled with hot water, or danger of sepsis from the rectal finger. I have the advantage over Mr. Ralphs of having worked alongside Sir Peter Freyer and being closely in touch with his cases during the whole period of his activity in prostatic surgery. What I have stated in regard to these disadvantages of the Freyer technique is the result of direct observation of Freyer's cases, as well as my own and those of other surgeons. My articles on the complications of this operation were published during Freyer's lifetime, and they elicited no response from one not prone to overlook such matters.

The operation that I have described is, Mr. Ralphs says, "by no means new." He saw a paper by Dr. E. S. Judd in 1916 describing it. I confess I had not seen this article, so I have looked up the Mayo Clinic reports for 1916 and subsequent years. In 1916 there are illustrations, but no description, of an open operation where the prostate is being partly dissected and partly enucleated by the finger in the Trendelenburg position. In 1917 there are similar illustrations and a short note about the control of bleeding.

Before that time I had been trying enucleation and dissection of the prostate in the Trendelenburg position with my bladder retractors in place, and had given it up in all but small fibrous or malignant prostates as being cumbersome and unsatisfactory. I then resorted, at first in a few cases and gradually as a routine method, to the operation I have described many times. In 1920, after my description of the operation was published, I saw Dr. Judd at Rochester operating in the method he had illustrated. He was using my bladder retractors very slightly modified, and told me one of his colleagues had brought them from London. The operation illustrated in Dr. Judd's article and the operation which I saw him perform is not the operation that I described.

Mr. Ralphs finds the open method difficult, and states that it is not an operation for the general surgeon. The question as to whether the operation was one for the general surgeon had not occurred to me. My object has been to get the best result for the patient, not to suit the operation to the general surgeon. But is Mr. Ralphs really qualified to speak for the general surgeon? I personally know many general surgeons who practise the operation that I have described and are satisfied with the technique.

Lastly, let me say that I hold no brief for an open operation if better results can be obtained by other methods. During the last three years I have published a series of articles dealing with the complications of suprapubic prostatectomy as I have seen them. It was to meet these complications that the open operation and other details of technique were developed, and not to push any special operation.—I am, etc.,

London, W., Feb. 12th. JOHN THOMSON-WALKER.

TREATMENT OF TUBERCULOSIS OF THE CERVICAL GLANDS.

SIR,—Dr. Flecker's letter in your issue of February 3rd (p. 211) on the comparative merits of treatment by operation and by irradiation raises a question that many surgeons and medical men are called upon to answer in daily practice. That the operative treatment of tuberculous adenitis still possesses a somewhat precarious reputation cannot be doubted or, indeed, wondered at. Yet the discussion on this subject, so ably introduced by Mr. John Fraser at the last meeting of the British Medical Association, showed that British surgeons of much experience in this branch are whole-heartedly in favour of operative treatment subject to certain limitations. My own experience in several hundreds of such cases leads me to submit to Dr. Flecker and to others who question the position of surgery in this disease that the localized type of disease in the upper deep cervical group in children, which is breaking down, or which resists non-operative treatment over a reasonable length of time, can be cured with certainty by a clean dissection operation, and that there is no other method available which offers the same prospect of a permanent and speedy cure in this type of case.

If the surgeon is not prepared to perform such an operation then it is far better to abstain from lesser operative measures and to employ irradiation or tuberculin injections, to deal with subcutaneous abscesses by repeated aspiration and injection of Calot's fluid, and not to overlook the value

of bodily rest during the active stage. The evil results of operation are due to its inadequate performance (particularly the perfunctory scraping operation without visual exposure of the seat of the disease), or to its performance in unsuitable cases; amongst the latter may be placed children under 18 months to 2 years of age, cases of widespread disease on both sides of the neck, and lastly the type resembling lymphadenoma.—I am, etc.,

Manchester, Feb. 8th. H. H. RAYNER.

PENAL DISCIPLINE.

SIR,—Dr. Mary Gordon is still a little misleading to the general reader. Only experts would know that when she says that girls are "put in irons" she means that they are restrained in a canvas body-belt with handcuffs of her own design—a design for which she claims that the patient cannot injure herself or anyone else—and that such confinement is for their own protection only and subject to the authority of the medical officer, checked by the visiting committee.

The girl mentioned by Dr. Mary Gordon was, as she (I think) means to say, of superior education and surroundings, and she had had exceptionally favourable opportunities of living a normal and successful life, for she had been on the staff of a leading London bank, of the Pensions Ministry, and of the Admiralty. But everywhere she had committed thefts. She was, in fact, so unbalanced that she was unfit to live in the open, and when she was transferred from Aylesbury to Rampton she destroyed herself in a fit of jealousy because another girl had been given a position which she desired. May it not reasonably be suggested that but for the use of Dr. Mary Gordon's improved method of restraint at Aylesbury the girl would have killed or seriously injured herself at a much earlier date?

I am not in the slightest degree responsible for the conduct of Borstal institutions, but the care of inmates on their release has brought me in contact with the officers of these institutions. They are not permitted to speak for themselves in the press, and should not suffer hasty and unmerited criticism.—I am, etc.,

WEMYSS GRANT-WILSON.

The Borstal Association, London, W.C., Feb. 12th.

Obituary.

ALFRED EDWIN HARRIS, L.R.C.P. AND S.EDIN.,

Formerly Medical Officer of Health, Metropolitan Borough of Islington.

IT is with regret that we record the death on January 24th of Dr. Alfred Edwin Harris, who in 1921 retired from the position of medical officer of health for the metropolitan borough of Islington. He was born in 1850 and received his medical education in Cork and Edinburgh; he obtained the diplomas of L.R.C.P. and S.Edin. in 1876. After engaging in general practice in Gosport for about six years he was elected the first whole-time medical officer of health for the borough of Sunderland and for the Sunderland port sanitary authority. He was also public analyst for Sunderland. In 1892 he was appointed medical officer of health to the Islington Vestry and subsequently to the metropolitan borough of Islington. Even while in practice he took a keen interest in public health, and when the Annual Meeting of the British Medical Association was held in Ryde in 1880 he contributed a paper on "The compulsory notification of infectious diseases." The problem of infant mortality engaged his attention at an early date, and suggestions which he made in 1879 for the employment of what in effect were health visitors actually materialized in later years, although in his own borough of Islington it was some time before he could persuade the borough council to give him a sufficient staff of these officers. He wrote very forcibly, and had the knack of pointing his argument by apt and well considered illustrations. Speaking at the meeting of the Sanitary Institute at Newcastle-upon-Tyne in 1882, on infant mortality, he said:

"I cannot believe that an Almighty hand ever sent these little ones into this world, that having lived in it an hour, a week, a month, a year, they should gain an eternity. Surely He never intended that these new spokes in the wheel of life should be injured or fall out through being rolled over rough and broken ground that it was never meant they should travel over."

With the coming into being of the metropolitan borough councils there was an awakening of the public health conscience in London, and Harris continued with increased vigour the efforts he had made under the vestry to improve the conditions of life of the inhabitants. How well he succeeded is recorded in his annual reports, the bare statements which they contained of decreased sickness, fewer deaths, and lengthening of life bearing testimony to the success of his efforts. He was essentially a pioneer and was never ashamed of appearing to be ahead of his time. He was among the first to advocate the notification of phthisis and of ophthalmia neonatorum, to press for the appointment of women sanitary inspectors, and to call for a clean milk supply. On his retirement in 1921 he had the satisfaction of leaving a public health department every detail of which had been built up by his untiring efforts and indomitable pluck. The inhabitants of Islington through all time will have cause to be grateful to Alfred Edwin Harris.

PROFESSOR RÖNTGEN.

THE scientific world, and not least its medical members, will learn with profound regret of the death of Professor Röntgen at Munich on February 10th. Down to four years ago he was director of the Physical Institute of that city, a post to which he was called from Würzburg some years after his discovery of x rays.

Professor Conrad Röntgen was born in Rhenish Prussia in 1845. He received his early education in Holland and in Switzerland, and later studied at the University of Zurich, where he received the degree of D.Sc. in 1869. After holding the usual minor appointments at several German universities, he went to Würzburg as professor of physics, and it was there that he made his discovery of the mysterious rays, designated by him "x rays"; to this day the name is used for the rays otherwise known all over the world as Röntgen rays.

The discovery was to some extent accidental, and Röntgen himself was the first to acknowledge the fact, though it must be stated that he was at the time engaged in a painstaking investigation into the action of the Crookes's tube. If proof were needed of the thorough scientific manner in which Röntgen probed into the secrets of nature, it is afforded in his subsequent action; he did not immediately publish his discovery, but from November 8th, 1895, to early in January, 1896, he devoted himself to a number of experiments ascertaining and recording physical data which have stood the test of time and are clear evidence of his great ability as a research worker. He communicated his results to the Physical Society of Würzburg in January, 1896, and the value of his discovery cannot even now, after the lapse of over twenty-five years, be estimated fully, for in spite of immense developments along special lines we are still only at the beginning of other developments which may prove to be of even greater importance. In physics theories previously current have been revolutionized; great progress has been made in the study of the structure of the atom; Laue has demonstrated the diffraction of x rays by crystals; Sir William Bragg has pointed out the similarity between x rays and light waves, and Bragg the younger has shown how the crystal reflection of x rays can be utilized to separate out the different wave-lengths. It was with the aid of the x-ray spectra that Moseley did his great work on atoms, and formulated the table of elements based on atomic numbers—work which will ever be associated with his name.

The value of x rays in medicine is hardly less great. From the very outset it was realized that a new and most powerful agent had been discovered. Röntgen was the first to observe that a fluorescent screen lying near a Crookes's tube which was covered with black paper to exclude the light from the tube when it was in action lighted up with a faint green fluorescence, and that the shadow of an object lying between the tube and the screen was plainly seen on the screen; he then used his hand as the opaque object and saw the outline of the bones. Here then was heralded, by the discoverer of the x rays himself, the birth of fluoroscopy. But Röntgen could not then have had any idea of the immense boon his discovery was to be to countless thousands of sufferers, and the immediate value of the rays to the medical profession. The developments in radiology have been very great, and elaborate methods have been evolved for the examination of practically every region of the human body. In the early days a radiogram of the hand was produced with an exposure of about twenty minutes; by the very powerful apparatus now used a much better picture can be obtained in about 1/100 of a second; that is a striking example of the advance made in one direction. In tube construction very great improvements have followed upon

patient research; yet greater advances can be confidently expected. Alike in physics and in *x*-ray diagnosis the value of Röntgen's discovery is fully proved, but the tale does not end there. Radiotherapeutics followed quickly upon the discovery of the action of the rays upon living tissues, and at the present day we have throughout the world countless sets of *x*-ray apparatus at work in the treatment of diseases of various types and affording relief to yet many more thousands of sufferers. Radiotherapy is ever advancing. The action of *x* rays having been recognized, another important discovery followed upon Röntgen's work. Radium was discovered by the Curies, and another important weapon placed in the hands of the medical profession. Armed with *x* rays and radium rays in his combat with disease, the modern medical man is able to grapple with conditions which up to the time of Röntgen's discovery had completely baffled him.

Röntgen steadfastly refused all remuneration for his work; he was content to know that he had given to the world an agent which would be of value throughout the ages to come. He lived long enough to see many of the developments initiated by his discovery. He died full of years and honour. The ever-advancing science of radiology will form a memorial for all time to the memory of a humble follower of science who has done so much for humanity.

ROBERT KNOX.

THE LATE MR. HUNTER TOD.

MR. PERCY SARGENT writes: To those who knew Hunter Tod well the otherwise excellent obituary notice which appeared in the JOURNAL of February 3rd seems singularly incomplete without some mention of his masonic activities. He had for many years been a keen freemason, and his interests were chiefly concerned with the masonic bodies connected with the hospitals and public schools. He was a founder and Past Master both of the London Hospital Lodge, No. 2,845, and of the Old Cliftonian Lodge, No. 3,340, and at the time of his death was treasurer of both those lodges. He had also occupied the Principal Chair of the Public Schools Royal Arch Chapter. In October last, on the occasion of the investiture of the Prince of Wales as Senior Grand Warden of England at the Albert Hall, the M.W. Grand Master conferred upon Bro. Hunter Tod the rank of Past Senior Grand Deacon of England.

Dr. ARCHIBALD CHALMERS of Crocketford, near Dumfries, was killed there in a cycle accident early in January. He was educated at Glasgow University, where he graduated M.A., M.B., and C.M. in 1892, after which he went into practice at Crocketford, where he was medical officer of Irongray parish. He took a temporary commission as lieutenant in the R.A.M.C. on July 26th, 1915, being promoted to captain on completion of a year's service; during the war he served at Malta and Salonica.

Universities and Colleges.

UNIVERSITY OF OXFORD.

THE theses submitted for the degree of Doctor of Medicine by W. S. Dawson, Trinity College, and D. G. T. K. Cross, St. John's College, have been approved by the judges.

UNIVERSITY OF CAMBRIDGE.

THE General Board of Studies has appointed Mr. J. B. S. Haldane, M.A., of Trinity College, to be Sir William Dunn's Reader in Biochemistry, and Dr. C. Shearer, of Clare College, to be University Lecturer in Embryology.

As recorded in the JOURNAL of February 3rd (p. 198) the Council of the Senate has recommended that the offer of the Ministry of Agriculture to establish in Cambridge, in connexion with the Schools of Agriculture and Medicine, a research institute for the study of the pathology of animal diseases, should be accepted subject to certain conditions regarding finance. The proposal was discussed in the Senate last week and received approval.

At a congregation held on February 10th the following medical degrees were conferred:

M.B., B.CH.—C. Lal Pasricha.
M.B.—F. G. Wood.

UNIVERSITY OF LONDON.

A MEETING of the Senate was held on January 26th.

In consequence of his appointment as Foulerton Research Professor of Physiology, Professor Starling has resigned the Jodrell professorship of physiology in the University.

In view of the decision of the Senate to close the Physiological Laboratory at the end of the session 1922–23, it was resolved that after the end of the present session no University funds be devoted to the continuance of the Physiological Laboratory; that arrangements be made for the transference of the staff, if possible, with other colleges or schools of the University. The Physiological Laboratory Committee was also authorized to negotiate for the disposal of the laboratory apparatus belonging to the University.

Dr. C. E. Dukes was recognized as a teacher in bacteriology at King's College for Women (Household and Social Science Department), and Mr. C. E. Dodds as a teacher of pathological chemistry at Middlesex Hospital Medical School.

Mr. H. J. Waring, as the representative of the University, has been appointed a governor of the Imperial College of Science and Technology.

Applications for the University Chair of Anatomy, tenable at St. Bartholomew's Hospital Medical College, salary £1,000 a year, should be received by the Academic Registrar at the University by April 16th.

A University studentship in physiology, value £50 for one year, will be awarded to a student qualified to undertake research in physiology. It is tenable in a physiological laboratory or a school of the University. Applications to the Principal Officer before May 31st. The full regulations for the award of the studentship can be obtained on application.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

AN ordinary Council was held on February 8th, when Sir ANTHONY BOWLBY, President, was in the chair.

Issue of Diplomas.

Diplomas of Membership were granted to 135 candidates found qualified at the recent examinations.

Diplomas in Ophthalmic Medicine and Surgery were granted to 13 candidates, jointly with the Royal College of Physicians. (The names were published in the report of the comitia of the Royal College of Physicians published on February 3rd, p. 217.)

Lectures.

The President announced that Sir Arthur Keith, conservator of the museum, would deliver a course of six Hunterian lectures on "Man's erect attitude: its evolution and disorders," beginning on March 5th. The President announced also that Mr. W. G. Spencer had been appointed Bradshaw lecturer for the ensuing year.

Court of Examiners.

The resignation of Mr. James Sherren from the Court of Examiners was accepted with regret. The vacancy will be filled in at the ordinary meeting of the Council on March 8th.

Election into Council.

The President reported that a meeting of Fellows would be held at the College on Thursday, July 5th next, for the election of four Fellows into the Council in the vacancies occasioned by the death of Sir Charles Ryall, by the retirement in rotation of Sir Charters J. Symonds and Sir Herbert F. Waterhouse, and by the resignation of Mr. F. F. Burghard; that notice of the meeting would be given to the Fellows by advertisement and by circular on March 9th; that March 19th would be the last day for the nomination of candidates; and that a voting paper would be sent on April 3rd to every Fellow of the College whose address is registered at the College.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH.

A QUARTERLY meeting of the College was held on February 6th, with Sir Robert Philip, President, in the chair. Dr. James Burnet and Dr. Disney H. D. Crau were admitted as Fellows, Drs. J. Farquhar Christie, William Glen Liston, C.I.E., William N. W. Kennedy, O.B.E., Max Lipschitz, R. McCall Burnie, were admitted Members. Dr. R. A. Fleming was elected a member of Council in room of the late Dr. J. W. Ballantyne. Intimation was made of a bequest to the College by the late Dr. Harry Rainy of a valuable collection of works relating to Dante, and of a gift to the College by Mr. J. W. Fraser Tytler, W.S., of a bust of the late Dr. James Gregory.

The Services.

AUXILIARY R.A.M.C. FUNDS.

AT the last quarterly meeting of the Committee of the Auxiliary Royal Army Medical Corps Funds grants were made to cases in the Benevolent Branch for the orphans of officers amounting to £289 18s. 11d., and grants in the Relief Branch for the widows and children of the rank and file amounting to £717 13s. 6d. These funds are for the relief of widows and orphans of commissioned officers, non-commissioned officers, and men of the rank and file of the Royal Army Medical Corps, Special Reserve, Territorial Force, and New Armies, and also for the relief of the children of those who have been so severely disabled in the late war that they need help for the education of children. Requests for relief should be addressed to the Honorary Secretary of the Funds, 11, Chandos Street, Cavendish Square, London, W.1.

Lieut.-Colonel A. E. Hamerton, C.M.G., D.S.O., R.A.M.C., has been appointed Assistant Director of Pathology at the War Office in succession to Lieut.-Colonel D. Harvey, C.M.G., C.B.E.

Medical News.

A JOINT meeting of the Röntgen Society and the Physical Society will be held on February 23rd, when there will be a discussion on the measurement of *x* rays.

AT a meeting of the Medical Officers of Schools Association to be held at 11, Chandos Street, Cavendish Square, W., on Friday, February 23rd, at 5 p.m., Dr. J. G. Forbes will read a paper on "Diphtheria carriers in children of school age."

COURSES of lectures on "The diseases of the periodontal tissues due to infection in their relation to toxaemia" will be delivered in London, Edinburgh, and Manchester under the auspices of the Dental Board of the United Kingdom. Each course will consist of four lectures, and is intended primarily for registered dentists and medical practitioners. Dental students and candidates for the prescribed examination of the Dental Board are invited to attend; tickets of admission are not required. The course in London will be given at the Royal Society of Medicine (1, Wimpole Street, W.) on March 1st, 8th, 15th, and 22nd, at 5.30 p.m. The course in Edinburgh will be delivered in Professor Thomson's lecture room at the University on March 2nd, 9th, 16th, and April 7th, at 5.30 p.m. The course in Manchester will be given in the Physiology Lecture Theatre, Victoria University, on March 1st, 8th, 15th, and April 6th, at 5.30 p.m. The lecturers are Mr. J. Howard Mummery, Mr. J. G. Turner, Sir William Willcox, and Professor E. E. Glynn, who will deal respectively with patho-histology, local clinical symptoms, systemic effects, and bacteriology.

IT is proposed to add to the accommodation provided at St. Mark's Hospital for cancer, fistula, and other diseases of the rectum by erecting on vacant land adjoining the present hospital an additional building, to contain twenty-one beds, a new out-patient department, and new pathological and *x*-ray departments. The estimated cost is about £10,000.

A BOOK on orthopaedic surgery by Sir Robert Jones, lecturer on orthopaedic surgery in the University of Liverpool, and Dr. Robert W. Lovett, professor of orthopaedic surgery in Harvard University, is in the press. It is a large volume, will contain 729 engravings, and will be published by William Wood and Company of New York.

A DISCUSSION on partial sterilization of soil will be opened by Sir John Russell, F.R.S., and Mr. H. G. Thornton, both of the Rothamsted Experiment Station, at a meeting of the Association of Economic Biologists, to be held at 2.30 p.m. next Friday at the Imperial College of Science.

SIR CHARLES BALLANCE will deliver a short appreciation of the life and character of the late Hunter Tod, F.R.C.S. (sometime President of the Section), to the members of the Otological Section of the Royal Society of Medicine, at 1, Wimpole Street, W., to-day (Friday, February 16th), at 5 p.m. Old friends and colleagues are invited.

IT is announced that the Council of St. Bartholomew's Hospital Medical College has acquired, for the purpose of extension, a block of premises in Giltspur Street, facing the main hospital buildings, and containing 17,000 sq. ft. of floor space, for new laboratories, lecture rooms, etc. We understand that these premises have been acquired from John Bell and Croyden, Ltd. (incorporating Arnold and Sons).

THE seventh annual report of the National Council for Combating Venereal Diseases, covering the period from June, 1921, to June, 1922, which has just been issued, contains a general account of the Council's activities, centrally and through the branches, which now number nearly a hundred in Great Britain. The Council's executive committee, being of opinion that information from countries, especially Canada, where legislation requires continuous treatment, would be of value, asked the Ministry of Health to authorize a commission from this country to inquire into the conditions in Canada with a view to ascertaining whether some of the steps adopted there with apparent success could not be taken in this country also; owing to existing financial circumstances the suggestion was not accepted. Inquiries were then addressed directly to the provincial health departments in Canada, asking for information as to the working of the legislation. Almost every medical officer's reply was to the effect that the system of confidential notification in force did not prevent people seeking treatment, and also that the law seemed to be working fairly well as between the sexes. The district conferences of the Council in this country have, it is stated, afforded evidence of a growing public opinion in favour of legislation enforcing continuous treatment of infective persons. Questions on this subject were circulated to the members of the Council and branches and members of other organizations represented on the Council. Most of the replies expressed the view that the health authorities should have power, to be obtained by legislation, to compel infective persons to remain under treatment, while the confidential treatment of persons willing to continue until they were non-infective should be preserved. Views were divided as to whether public opinion, in the districts of those replying, was ripe for such a change. Alternative proposals included one for the reporting by medical officers of clinics, and by private practitioners, of cases of syphilis and gonorrhoea among infants, children, and adolescents, to the school medical officer, with a request that the school nurse should follow up those failing to attend for treatment. The work of the colonial commissions sent out by the Council is reflected in reports from the allied councils and branches overseas. At several places at which the commissions touched facilities for treatment have since been provided or extended, and at Trinidad a Venereal Diseases Ordinance has been passed which is said to be checking quack remedies. In reply to a request for a Government grant of £15,000 for 1921–22, the Council was informed that this amount must be reduced by £1,000, that a further reduction of 30 per cent. must take place in the Government grant for 1922–23, and that after the end of 1923 the Government hoped that no further financial call would be made. The Council is therefore taking measures to increase its income from voluntary sources.

SIR FREDERICK TREVES'S new book has been published this week by Messrs. Cassell (7s. 6d.). It contains twelve stories or sketches, and the title of the book—*The Elephant Man*—is that of the first, which is a moving account of the sufferings and the psychology of a young man whose terrible deformities made him a show; in certain areas immense hypertrophy of the skin was present, and there were, in addition, bony deformities of the skull and face. The case was fully reported in our columns, with illustrations, on December 11th, 1886 (p. 1188), and on April 19th, 1890 (p. 916).

A COURSE of three public lectures on psychology and psychotherapy will be given in the Department of Psychology, King's College, on February 19th, 26th, and March 5th, at 5.30 p.m., by Dr. William Brown, Wilde Reader of Mental Philosophy in the University of Oxford.

MRS. MARRYAT, sister of the late Sir James Caird, of Dundee, has presented £20,000 to Dundee Royal Infirmary. The directors were about to issue an appeal for that amount to provide additional operating theatres, a central electrical department, etc., but, thanks to this generous gift, the appeal will not now be made.

CASES of small-pox continue to be reported here and there. At Doncaster down to February 9th there had been a total of 93 cases; 8 had occurred within the preceding week. Two or three others were notified at Bentley, not far off, but at Heanor (Derbyshire), where there had been 49 cases, there were signs of abatement. In January the total number of cases in the Basford rural district were 11.

THE Yorkshire Association of the University of Edinburgh met at the Midland Hotel, Bradford, on January 24th. At the general meeting it was decided that the society be known in the future as the West Riding Association. An enjoyable dinner followed, at which sixty members and guests were present. The president, Dr. Rabagliati, proposed the toast of the University. Professor Lorrain Smith, the guest of the evening, in his reply traced recent developments and changes in the University, referring especially to its connexion with Paris and to the recent lamented loss of several of its distinguished teachers. He warmly congratulated the society on its successful resuscitation and took back the best wishes of the graduates to their Alma Mater.

PROFESSOR VINCENT has been elected a member of the Académie des Sciences in place of the late Professor Laveran.

THE late Miss M. L. Jeffcock, of Worksop, Notts, has bequeathed £1,000 to the Sheffield Royal Infirmary; £500 to the Jessop Hospital for Women, Sheffield; and £500 to her medical attendant, Dr. George Kemp.

THE Cambridge University Press announces for early publication *Problems in Dynamic Psychology: A Critique of Psychoanalysis and Suggested Formulations*, by John T. MacCurdy, M.D., Lecturer on Medical Psychology, Cornell University Medical College, New York.

PROFESSOR BORDET of Brussels, director of the Pasteur Institute of Brabant, has been made a Commander of the Legion of Honour.

THE Ministry of Health has issued draft regulations, to come into force on August 1st, with regard to the labelling and composition of condensed milk. Every tin must bear a label specifying whether it is full cream, unsweetened, or as the case may be, and stating the equivalent volume of milk (or skimmed milk) contained in it. Tins of condensed skimmed milk are to be labelled "unfit for babies," and instructions as to dilution must be quantitatively accurate. The regulations provide further that condensed milk sold as "full cream unsweetened," or "full cream sweetened," must contain 9 per cent. of milk fat.

THE Council of Epsom College will shortly award "France" pensions of £30 a year to medical men. Candidates must not be less than 55 years of age, and their yearly income, independent of any allowance from the College, must not exceed £100. Application should be made to the Secretary, Mr. J. Bernard Lamb, 49, Bedford Square, W.C.1.

A CIRCULAR (366) has been issued by the chief medical officer of the Ministry of Health, stating that it has been decided to discontinue the practice of forwarding special forms of inquiry when cases of encephalitis lethargica are reported. The facts obtained by these forms have recently been summarized in a report (noticed in the JOURNAL of October 7th, 1922, p. 654), and it is considered improbable that the collection of further details by means of these forms will provide much additional information. It is pointed out that encephalitis lethargica remains on the list of diseases which are compulsorily notifiable, and that the Ministry of Health undertakes the examination of cerebro-spinal fluid in cases of suspected cerebro-spinal fever. The work of Dr. E. G. D. Murray for the Medical Research Council on the subject of the production of an immune serum for therapeutic use in cerebro-spinal fever has been retarded, it is stated, by scarcity of material, and pathologists are asked to send cultures of freshly isolated strains of meningococci from the cerebro-spinal fluid of cases of meningitis direct to Dr. Murray, at the Field Laboratories, Milton Road, Cambridge; special outfits for this purpose may be obtained free of cost at the offices of the Medical Research Council, 15, York Buildings, Adelphi, London, W.C.2.

Letters, Notes, and Answers.

As, owing to printing difficulties, the JOURNAL *must be sent to press earlier than hitherto, it is essential that communications intended for the current issue should be received by the first post on Tuesday, and lengthy documents on Monday.*

IN order to avoid delay, it is particularly requested that ALL letters on the editorial business of the JOURNAL be addressed to the Editor at the Office of the JOURNAL.

THE postal address of the BRITISH MEDICAL ASSOCIATION and BRITISH MEDICAL JOURNAL is 429, Strand, London, W.C.2. The telegraphic addresses are:

1. EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology, Westrand, London*; telephone, 2630, Gerrard.
2. FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate, Westrand, London*; telephone, 2630, Gerrard.
3. MEDICAL SECRETARY, *Medisecra, Westrand, London*; telephone, 2630, Gerrard. The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin (telegrams: *Bacillus, Dublin*; telephone, 4737, Dublin), and of the Scottish Office, 6, Rutland Square, Edinburgh (telegrams: *Associate, Edinburgh*; telephone, 4361, Central).

QUERIES AND ANSWERS.

DR. MAUDE K. HOSAIN (110, King's Gate, Aberdeen) writes: If any of your readers could spare their quarterly copy of *Brain* after they have finished with it, to send to one of the German universities, will they kindly communicate with me?

DISTEMPER IN DOGS.

DR. J. S. MANSON (Warrington) writes with reference to the proposal for research into the etiology of distemper (BRITISH MEDICAL JOURNAL, February 10th, p. 249): I have been under the impression for some years that the bacillary origin of distemper was discovered by McGowan of Edinburgh, and that this discovery had been corroborated by American workers. Reference is made to McGowan's researches into canine distemper and other diseases of domestic animals in the book entitled *Edinburgh's Place in Scientific Progress*, issued to the members of the British Association attending the annual meeting in 1921. The great interest shown at the Glasgow meeting of the British Medical Association in the papers and discussion on animal and plant pathology, to which Sir Clifford Allbutt made a notable contribution, induces me to express the hope that someone familiar with these topics will say whether we are as ignorant of the cause of canine distemper as is implied in the statements of the lay press.

*** Dr. McGowan has done a great deal of work with regard to distemper, and has described an organism, *B. bronchi-septicus*, the only cultivable micro-organism which he found to be present with uniformity and in great numbers in the tissues and organs of cases of canine distemper. He has stated also that typical distemper may be induced by infection with pure cultures of this micro-organism, and that dogs which have recovered from attacks so induced are protected on exposure to natural distemper. Dr. McGowan's experiments have led him also to the conclusion that distemper occurs in many other animals besides dogs, and he has described an outbreak, among pigs, of a destructive infection which he believed to be distemper. We gather, however, that Dr. McGowan's results have not so far been generally accepted by the veterinary profession, and we must assume that the Medical Research Council is of opinion that further inquiry is needed. We hope to recur to the subject on a subsequent occasion.

LETTERS, NOTES, ETC.

RITTER'S DISEASE.

DR. D. WALSH (London) writes: The rare condition described by Dr. Ronald Cairns in your issue of February 3rd (p. 186) suggests an origin in local anaphylaxis. A similar explanation possibly or probably applies to those rare cases in which bullae persistently follow slight traumatism. The precise nature of the antigen in either instance would still have to be ascertained, and naturally one would investigate food idiosyncrasies, at any rate in elder children or adults.

EARLY HUMAN OVA.

DR. R. H. BOTHAM (Skelton-in-Cleveland) writes: Some time ago an embryologist was inquiring through the BRITISH MEDICAL JOURNAL for early fertilized ova. I have a good specimen of seven weeks, which I shall be pleased to send anyone interested. Also a foetus of ten weeks.

A MISQUOTATION.

DR. C. F. CLARKE (Woolwich) has put his finger on a misquotation in our issue of February 3rd. He says:

"The writer of the obituary notice of Dr. Dickson of Marlow introduced a verse from Tennyson at the end. But

> "The peaceful stream glides on
> Through the vale and under the hill"

should be

> "And the stately ships go on
> To their haven under the hill."

The lines are from 'Break, break, break'—a tiny classic—which will not bear a word of alteration."

We submitted this to the author of the memoir—"J. A. P. P."—who pleads guilty, and asks to be allowed to set himself right with our readers.

"I was rash and presumptuous," he says, "in daring to alter the beautiful words of the great Victorian poet to suit the changed locale from Severn Sea to Father Thames; in a footnote in the obituary notice I ought perhaps to have apologized for so doing, but such a note appeared to me inappropriate. I am therefore all the more grateful to you for giving me this opportunity of explaining and apologizing to your readers."

This handsome admission impels us to add a word of apology on our own account for the lapse from editorial vigilance.

DETERMINATION OF SEX.

DR. REGINALD MAPLES (Kingsclere) writes: Dr. R. A. Parker's letter (January 27th, p. 174) is most interesting to me, but exactly opposite to my own experience. For the past thirty-five years I, together with many friends, have systematically bred from our small herds calves of the sex we wished by simply following the following rule: If a cow has a bull calf and you wish to continue bull calves you must send her to stock on the second, fourth, or sixth period of coming "on use." If, on the contrary, you desire heifer calves you must send her on the first, third, or fifth period, and so on, till she is stopped. This rule is infallible if you have a reliable cowman to keep observation. This does not apply to a heifer with her first calf, because you have no record how many times already she has been "on use." I have helped many a farmer to breed to sex by giving him this advice. I have some extraordinary reliable records.

ERRATUM.

IN Dr. Mary Gordon's letter on penal discipline (BRITISH MEDICAL JOURNAL, February 3rd, p. 212) the sixth line of paragraph 5 should read "superior surroundings and education," etc., not, as printed, "inferior."

VACANCIES.

NOTIFICATIONS of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 30, 31, 34, and 35 of our advertisement columns, and advertisements as to partnerships, assistantships, and locumtenencies at pages 32 and 33.

A short summary of vacant posts notified in the advertisement columns appears in the *Supplement* at page 55.

SCALE OF CHARGES FOR ADVERTISEMENTS IN THE BRITISH MEDICAL JOURNAL.

	£	s.	d.
Six lines and under	0	9	0
Each additional line	0	1	6
Whole single column (three columns to page) ...	7	10	0
Half single column	3	15	0
Half page	10	0	0
Whole page	20	0	0

An average line contains six words.

All remittances by Post Office Orders must be made payable to the British Medical Association at the General Post Office, London. No responsibility will be accepted for any such remittance not so safeguarded.

Advertisements should be delivered, addressed to the Manager, 429, Strand, London, not later than the first post on Tuesday morning preceding publication, and, if not paid for at the time, should be accompanied by a reference.

NOTE.—It is against the rules of the Post Office to receive *poste restante* letters addressed either in initials or numbers.